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Imaginary Playmates

and

Other Mental Phenomena
of Children



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PREFACE

The material for the discussion of the topics in the following pages has been drawn from individual reports and personal interviews with more than five hundred different persons whose experiences are recorded. I have the fullest confidence in the accuracy of the reports and the sincerity with which they were made. I knew each person intimately, and a personal interview permits a kind of cross questioning and comparison with the reports of others which it is impossible to employ in a written questionnaire. The reports upon which the following chapters are based are absolutely truthful, and as accurate as the circumstances will permit.

This book has developed out of a series of lessons on Individual Differences. In general, our psychology as a part of the professional preparation for teaching, has failed to function to the degree that it should. The reason for this partial failure seems to be that we have been teaching only one phase of psychology. The laws of psychology which we have been teaching, are statements of the resemblances between the mental processes of all persons. But teachers must deal with individuals, and individuals manifest differences as well as resemblances. It is as much a necessity for professional preparation to study individual differences as it is to study general resemblances.

Individual differences are of two kinds; quantitative and qualitative. The quantitative differences are studied by a process of mental measurement. They exist in processes that are common to all individuals, but manifested in different degrees. An example of this kind of difference is seen in reaction time, which differs widely in different persons.

But there are qualitative differences as well as quantitative. Some persons have mental experiences that are altogether wanting in others. The topics treated in this book represent this kind of individual differences.

The topics selected for treatment are of different degrees of familiarity to psychologists. Some of them have already been very thoroughly treated, but others, such as Imaginary Playmates, Images in Reading, Paramnesia, Illusions of Orientation, and Original Languages, have been but slightly investigated. All of these topics are of special interest to all

persons, and constitute the most attractive feature of psychology to a very large number of students. They are to psychology classes, what electricity is to a boy beginning to study physics.

The bibliographies are not intended to represent anything like a full list of publications upon the subject, but merely to indicate the kind and amount of reading that may be expected to be done in connection with each chapter.

Ypsilanti, Michigan, September 12, 1918.

CHAPTER I

IMAGINARY PLAYMATES.

The soul of a child embraces elements that are incomprehensible to the grown up man. It contains chambers into which the light of mature intellect can with difficulty penetrate. Its experiences seldom receive their proper appreciation, and the child and the parent are of necessity, comparative strangers. To know the child, we need to know what his childish experiences are, and we must inquire of the child what those experiences may be.

The experiences of children differ widely from each other. The experience of one child is no criterion by which to judge of the experiences of another. Children differ as wide as the poles in the experiences which they encounter. Only by a collection of many divergent experiences of different children are we able to comprehend what the actions of any particular child may mean.

Some children have playmates that are wholly imaginary, but which are as vivid and real to them as living playmates would be. These playmates are not merely vivid ideas, or imaginings, but actual visual and auditory projections. They can be seen and heard as vividly as if they are living children. Some typical cases will best show the characteristics of these imaginary playmates.

Miss Ruby C. was an only child. She had two imaginary playmates whom she knew by the names of Katie Fendus and Nellie Brosus. These playmates were two little girls of about her own age, who were as vivid and distinct to her as two living children would be. She could see them very plainly, and could hear the tones of their voices when they were talking. She describes clearly how they were dressed, and how they wore their hair. Sometimes the three of them would play together, and sometimes she would sit still and watch them play. The three of them sometimes played school, and she remembers that they used to tell her how to spell words. One time they told her to spell meat, meqfeg, which was not correct.

Miss C. remembers seeing these two playmates as early as she can remember anything. Certainly they appeared to her by the time she was three years old. She does not remember

the circumstances of their first appearance, nor how they received their names. Neither does she know the occasion for their disappearance, which occurred when she was about eight. She often talked with her mother about the doings of Nellie and Katie. In fact, it was rather a common subject of conversation with her.

Another case will emphasize the same features of this typical example. Miss Bessie C. reports that she had an imaginary playmate whom she called Dorothy. Dorothy began to appear to her when she was about seven or eight years of age, and continued until she was about twelve. Dorothy was a little girl of just about her own age. She could see Dorothy as clearly as she could see a living child, and could hear the tones of her voice when she talked. Dorothy went to school with her, and in fact, the two girls were together nearly all the time. She and Dorothy played with their dolls, and would have tea parties together. She always insisted upon an extra place at the table for Dorothy, with plate and knife, and would become indignant at her mother, who could not understand who Dorothy was, and the necessity for the extra equipment. At Christmas time, Bessie always hung up an extra stocking for Dorothy. She never quarreled with Dorothy, but she does not remember that Dorothy ever told her anything which she did not already know.

These two cases manifest the characteristics of at least half of all the reports of imaginary playmates.

1. Vividness. Nearly always they are described as being as vivid as a living child would be.

2. Both visual and auditory. They can be both seen and heard.

3. They are children of about the same age as the child who experiences them.

4. They are really playmates, whose society is enjoyed by the one who experiences them.

5. They are known by some name similar to that of other children.

6. They begin to appear early in the life of the child. Usually, they are seen by the time the child begins to remember anything, and the manner of their beginning is indefinite and not known.

7. They disappear gradually, without attracting attention, either about the age of eight, or about the age of twelve.

8. The occasion for their disappearance is seldom recognized.

9. Their appearance is generally described, and often made the subject of conversation with parents, or with other children.

10. They are not hallucinatory. The child recognizes that they differ from real, living, objective children.

While these are the points in which a very large number of imaginary playmates will agree, there is not a single one of them in which great variations do not occur. Let us examine each characteristic separately.

1. Vividness. It is difficult to convey to a person who has not had a similar experience, just what is meant by the vividness of an imaginary playmate. Many persons can remember how an object looked, who have no capacity for visualizing it, projecting it, or re-seeing it. The difference between an idea of a thing and a percept of a thing consists principally in the difference in intensity of the nervous impulse that accompanies the two processes. For the moment, we may be satisfied with the statement that the imaginary playmates are as vivid as living children would be, and that there is no perceptible difference in their appearance.

2. They are both visual and auditory. They are both seen and heard. While this is the general rule, it is not universal. Miss Christine M. describes a playmate, who was a little girl always dressed in white, stiffly starched, and with a short skirt, whom she could see very clearly. The appearance was visual only, and she never heard the playmate talk. Similarly, Mr. Rollin R. reports that for several years he had an imaginary playmate, who was a little Indian boy of about his own age, whom he followed frequently through the woods, and from whom he learned many things in wood craft, but whose voice he never heard, and with whom he never talked.

Less common is the experience of an imaginary playmate that is exclusively auditory. Miss Lucille B., however, reports that she had a toy telephone, by means of which she regularly visited with an imaginary playmate, whose voice she could distinguish clearly and knew it well, but whom she never saw.

Every day she would report to her playmate over the telephone that happenings of her day at school, and would receive similar reports from her playmate at the other end of the line.

Even more emphatic is the case of Miss Lurah M, who with her two sisters, had two imaginary playmates whom they knew by the names of Banter and Dedy. Banter and Dedy were two boys who lived in the upper story of an old granary, the lower floor of which constituted the regular playhouse of the three girls. Miss M. never saw the boys, but she talked freely with them and they talked freely to her. She knew intimately the sounds of their voices, and they talked with her and with her sisters a great deal. The boys were great travelers, and would often tell the girls about the places they had visited. The girls often played keeping house, and would have tea parties and make mud pies. These mud pies they regularly handed up to the boys in the loft, asking their opinion of the excellence of the pies.

3. In more than half of the cases, the playmates are children of approximately the same age as those to whom they appear. The variations from this rule are interesting and very funny. In some cases, instead of being children, the playmates are grown up men and women. Miss Fay P. had three playmates; one of them was a tall dark man whom she knew as Patty. She did not like Patty, and was rather afraid of him, and avoided him whenever she could. A second was a tall man with a high hat whom she knew as Dr. Cady, and whom she liked greatly. A third was a negro woman who always wore a red bandanna handkerchief around her head. She liked her very much. These three persons were very commonly with her for several years.

A somewhat similar case is that of Miss Phyllis S., who had a playmate whom she called Sister Ogle. Sister Ogle was a young lady about "high school age," probably seventeen or eighteen years old. She sometimes came to see Phyllis, who was six or seven, and on such occasions Phyllis would get out a large sachel, which she always referred to as Sister Ogle's sachel. In this sachel were many presents that Sister Ogle always brought for Phyllis, as well as a wonderfully beautiful party dress which Phyllis greatly admired. The presents and the dress were wholly imaginary.

But the imaginary playmates are not always even persons. Miss Wilma G. reports the case of her little brother who has a flock of sheep which manifest all the characteristics of imaginary playmates. There are several lambs in the flock, and he sometimes carries one lamb under his arm while driving the other sheep from one room to another.

Miss Lottie G. reports that after having visited a county fair, at which she was much interested in an exhibit of collie dogs, two imaginary collie dogs, which she called Popsie and Wopsie, appeared to her and were her constant playmates for two years.

Miss Bessie S. reports her experience with an imaginary playmate who was not a little girl. When she was four or five years old, her family lived in a house that had considerable ground around it, and which was near a railroad. In one place there were several thornapple trees, under one of which was a pile of rocks. This particular spot was especially attractive to her as a place to play. But this particularly attractive place was inhabited by a ferocious little dwarf who would rush out at her whenever she went to that place to play, and chase her home, swinging his arms, clawing at her and shouting. He was not so large as she was, and he always wore a funny cap. She discovered, however, that she could placate the dwarf, or prevent his appearance, by carrying to that place a dish containing water with a mixture of pepper and salt. It was a very vivid experience, and continued as long as her family lived in that place.

The imaginary playmate is not necessarily a person, nor even an animated creature. Miss Marguerite H. lived in a town only two blocks from a railroad. Her house had a front door that was seldom used, and a side door which was the usual means of entrance. Whenever she was going from the front around to the side door, she would see a train of cars moving along at her side. Whenever she was walking down town, the train would accompany her, moving along at her side until it came to the railroad track, when it would jump onto the rails and continue its journey. She was not in the least afraid of the train, and even designated it familiarly by the name of John. When her family removed from that town, the train never reappeared.

4. When we think of playmates, we think of something that maintains an enjoyable relation to us. So an imaginary playmate may be expected to hold an agreeable relation to the child who experiences it. In many cases, however, the imaginary playmate is not enjoyed, nor liked, but sometimes is an object of hatred. Thus, Miss Frances B. says that she had a whole family of imaginary playmates. The family was named Kangaroo, and consisted of a man and his wife, with several children. One of the children was especially prominent in the experience. This was a girl named Polly, who was a bad girl and far from handsome. Polly was often left in the care of Frances who hated her, and was quite tyrannical with her. She would sometimes shake Polly, and shut her in the closet, where she could hear her cry and sob very distinctly.

Mr. Pearl B. and his real playmate, a boy named Kops, had an imaginary playmate whom they knew by the name of Gordon. Gordon was a grown up man with a dark beard and backwoods clothes, and quite tall. A favorite sport of the boys was to build dams in the stream, and Gordon was always trying to tear them out. Their entire association with Gordon was a fight, or contest.

Somewhat similar is the experience of Miss Bessie R. who, with her sister, had an imaginary playmate whom they called Ella. Ella was about eleven years old, had dark eyes and dark hair, which she always wore in a single braid down her back. Neither of the girls liked Ella. Ella was mean and mischievous. She always hurt their dolls, and they would feel distressed when they saw Ella coming, and would feel relieved when she went away. Miss Bessie and her sister still speak of Ella, and when their room manifests a very disorderly appearance, they remark that it looks as if Ella had been there.

5. Nearly all the imaginary playmates have names applied to them, but in only a few cases is it possible to suggest why the particular names are applied. The name is not an essential attribute to the experience, and in some cases the playmate has no name. Thus Miss Pearl Y. had an imaginary playmate who began to appear to her when she was about four years old and continued with her until she was eight. The playmate had dark hair which she wore down her back in two braids. Miss Y. could see the playmate very clearly and could

hear the tones of her voice when she was speaking. The playmate had no name, and Miss Y. has never before had her attention called to the singularity of the whole experience.

In a few cases it is possible to suggest the probable origin of the name. Blanche B. and her sister had two families of imaginary playmates. One family was named Spoopendyke and lived on the south porch. The family consisted of a father, mother, and several children, one of whom, Sarah, was the one with whom the girls were especially acquainted. The other family was named Boosenbark, and the member of the family in whom the girls were especially interested was Nellie. They liked Nellie very much, but Sarah Spoopendyke was not very agreeable, and they rather avoided her. The name Spoopendyke was probably suggested by the fact that Spoopendyke was the name of a character around which was built a large and long continued series of very humorous stories. Similarly we find that Miss Ruth W.'s playmate had the name of McGunty, a slightly modified form of the name of the hero of a very popular song.

6. In nearly all cases, the testimony shows that the imaginary playmate began to appear to the child very early. Much the larger number of persons having the experience say that they have seen the playmate always, or as early as they can remember anything. But in some cases, the origin and development of the playmate can be traced. Thus Miss Anna Y. says that she had a girl chum who read fairy stories, and romanced a great deal. She and her chum developed out of the fairy stories, an imaginary playmate whom they called the Mermaid. She could see the Mermaid very clearly, and could hear her talk. She and her chum would both take their dolls and go to see the Mermaid, and they both played with her.

Another case will show the development of the imaginary playmate out of make-believe. Miss Lida C. says that she and her three sisters had a whole town of imaginary playmates who lived in the fence corners around the fields. They had all of them named, and would visit with them, and play with them by the hour. To her, the children were vivid as living persons would be, and she could see them as clearly as she could see living persons. In this case, there can be no doubt that the playmates were developed out of make-believe. The children

said at first "let us play" so and so. Finally, a really vivid visual projection occurred.

Make-believe implies a conscious purpose on the part of the one who employs it. In much the greater number of cases, there can be no supposition of conscious purpose, and the cause for their appearance, and for the particular forms that they take is altogether beyond the reach of explanation.

Another case, which really belongs to a different category, will illustrate another aspect of the process by which such appearances begin. Miss Hazel G. heard her mother read aloud the story of Ann of Green Gables. Later, she read another book, Ann of Avon Hall, in which were recorded the deeds of the same characters. Ann soon became to her a vivid personality, as real as a living person would be. She could see Ann very clearly, and Ann was regarded as a very dear friend. She often consulted Ann about her plans, and Ann was very sympathetic with her.

Similarly, Katherine McL. when she was about six years old, together with a girl friend, came to know something about the activities of Jesse James. They either read about him, or heard some one else read about his exploits. Shortly afterward, they became able to see Jesse James. He appeared to them rather frequently, sometimes in the capacity of a robber about to attack and rob them, and again in the character of a friend willing and ready to lend them assistance. She could see Jesse James as clearly as if he had been a living person, and she could hear him speak. She and her friend often talked about him, and they described to each other how he looked, so that she believes that the appearance was the same to both.

7. The disappearance of the playmate is not often attended with any noticeable event. The disappearance is gradual and does not attract the attention of the child, so that few of the persons who report their experiences are able to fix a definite occasion for their disappearance. However, in a few cases the occasion for their disappearance has been noted.

Miss Alice B. had two imaginary playmates, Doty and May. She liked Doty the better, although May was a welcome playmate. When they had tea parties, Doty always asked the blessing. One day in winter, they were all in the house, and

May was sitting in a rocking chair by the fireside, when Miss B.'s mother came in and sat down in the rocking chair on May and killed her. Miss Alice says that she screamed, and did her best to keep her mother from sitting down in the chair, but her mother laughed, not seeing anything in the chair, and sat down. Miss Alice was terribly distressed, and cried for half a day, but May was dead and never reappeared.

Similarly, Miss Marian C. reports that her little brother had an imaginary playmate who was a baby. One day, the little brother accidentally killed the baby with a hoe. He was terribly distressed over the circumstance, and still grieves (at the time of the report) over the occurrence, but the baby has not reappeared.

Sometimes the disappearance is the result of punishment or scolding, or reasoning with the child by the parent. In the case of Miss Phyllis S. whose imaginary playmate, Sister Ogle, is referred to above, Miss Phyllis had a grandmother, who had an imaginary playmate whom she called the Mermaid, and in whose companionship she took a great deal of satisfaction. Some visitors, however, when they discovered that the grandmother was talking to imaginary persons, were very much concerned, and advised the parents to take measures to stop it. because they were sure that it was an indication of mental unsoundness, or some other terribly disgraceful condition. This the parents did, much to the distress of the grandmother, who cried long and hard over the disappearance of the Mermaid, and the conviction that she was not a real creature. So when Phyllis grew into the companionship of Sister Ogle, the grandmother was determined that she should not be caused the same kind of distress that had occurred to her in the disappearance of the Mermaid. Consequently Phyllis was permitted to enjoy the experience with Sister Ogle to her heart's content.

8. An examination of the accounts of different persons who have experienced imaginary playmates indicates that most of them disappear principally at two periods. There is a tendency in the reports to fix the age at which they disappear either at the age of seven or eight, or at the age of eleven or twelve. These dates correspond approximately to the period of transition from infancy to childhood, or the time of transition from childhood to adolescence. These dates may be rough-

ly described as the time of the second dentition, or the oncoming of the adolescent changes.

Such disappearances are not, however, universal. In the case mentioned above, where Miss Bessie R. and her sister had an imaginary playmate Ella, Miss Bessie says that she still catches occasional glimpses of Ella.

Miss Mabel B. had two imaginary playmates, whom she knew as Fred and his sister. The sister had no other name, and was rather insignificant in the experience. Fred was about the same age as herself, and grew up, as she grew up herself. She often consulted Fred about what was best for her to do, and she came to believe that it was a pretty good thing to follow Fred's advice. She gave several examples of serious consequences following occasions when she had refused to heed the admonitions of Fred. I said, "When did they cease to appear?" "Why," Miss Mabel said, "I see them yet. Yesterday, I saw Fred's sister looking over your shoulder in the class."

Similarly, Miss Grace M. reports the case of her brother, who is a young man, eighteen years old, and who is very fond of hunting. He has an imaginary playmate who has been with him ever since he can remember, and who still persists. Her brother assures her that whenever he goes to shoot, he looks carefully to see that his playmate is not in the way, and in danger of getting shot. However, this is unusual, and these three cases are about the only ones in the series of 109 that have been carefully studied, in which there is a persistence of the playmate experience into the adult years.

9. Most of the cases referred to above, have been comparatively simple. But in some examples, the experience becomes almost bewilderingly complex. Miss Winifred B. when a little girl, liked very much to play with paper dolls. It appears that her imaginary playmate grew out of this circumstance, and seems to have been developed from make-believe. Her imaginary playmate was her husband, and the father of her paper dolls. Her husband's name was Samuel, and he was decidedly a henpecked husband, for she ordered him around unmercifully. She could see Samuel as clearly as she could see a living person, and could hear him talk, and knew the tones of his voice. When she ceased to play with paper dolls, Samuel gradually faded away.

Miss Vaida B. had an imaginary playmate whom she called Salt Nellie. Salt Nellie was a little girl of just her own age, whom she was able to see very clearly. Nellie was sullen in appearance, had brown hair, and always wore a rather old, faded dress. She and Nellie never played together, and Nellie never appeared except when Vaida had been naughty. She had the feeling that somehow she had been changed into Nellie when she had been naughty.

In this case, it might appear a reasonable suggestion that the appearance of Nellie grew out of a circumstance such as the mother's saying to Vaida, for punishment, "You have been a bad girl. Stand in front of the looking glass, and see how a bad girl looks."

Another complex case is illustrated by the experience of Elsie F. Miss Elsie had an imaginary playmate whom she knew as Leah Lynn Jones. Leah was a little girl about as old as herself, who lived in the playhouse in the back yard. Leah had dark hair and always wore a pink and white checked dress. She could see Leah very clearly, and she could also see Leah's mother. She and Leah played together a great deal. They would play school, and study arithmetic together. She would sometimes read aloud to Leah, and she remembers that she read Peck's *Bad Boy* in this way.

Leah had another playmate, a wholly imaginary girl, named Eula. Elsie and Leah frequently quarreled over Eula. It appears that Elsie was jealous of Eula, who was Leah's especial friend. Sometimes Elsie would quarrel directly with Eula, and she never liked her.

An exceedingly complex case of imaginary playmates is the experience of Miss Bertha L. Miss Bertha had several real playmates, all of them boys. One boy told her one day, that he had proposed marriage to a girl, wholly imaginary, or make-believe. Both she and the boy friend from that time began to talk about that make-believe girl, whom they came to know as Hazel. Shortly afterward, she began to see Hazel as clearly and as vividly as she could see a living child. Soon thereafter, an imaginary boy named John began to appear. John was a dark complexioned boy. They all played with John, and invited him to their tea parties.

They told another family of real children about John and

Hazel, and soon the other children began to see them. John subsequently brought with him his imaginary friend, Sam, who was a red headed boy, light complexioned, living down near an old appletree. The real children and the imaginary children played together, and would laugh and shout. They played tag, and fox and geese, and the imaginary children would run and catch them and be caught by them just as real children would be.

Not very long afterward, two imaginary grown up persons were added to the list. These were Mr. and Mrs. Shopey who had a large, white, imaginary bulldog. The children, real and imaginary, did not like Mr. and Mrs. Shopey, and would tease Mrs. Shopey in an exasperating manner, which would incense Mr. Shopey who would run after them, and chase them, and set his white bulldog on them.

10. A question would seem natural concerning the places in which these imaginary playmates lived. In probably half the number of cases, the question does not arise in the minds of the children who experience the playmates. The question simply does not occur to them. Inquiry concerning their notion of the playmate's place of habitation produces such answers as the following: Whenever she went out on the playground, the playmate came; or, she just thought about the playmate, and the playmate appeared.

But in some cases, the playmate has a definite location. Miss Blanche T. had an imaginary playmate whom she knew as Giddy. Giddy was a grown up woman who lived in a hollow log about a quarter of a mile from her house. When she wanted to talk to Giddy, she would go to Giddy's house and talk things over with her. Giddy never came to her house. She would sometimes take other persons to Giddy's house, and try to get them to talk to Giddy, but generally the other persons were but little interested in Giddy. She never saw Giddy, and does not know how Giddy looked, for the appearance was altogether auditory.

In the accounts referred to above, we have seen that the two imaginary boys, Banter and Dedy, who were the playmates of Miss Lurah M., lived in the upper floor of the old granary. In Miss Bertha L.'s account, the second imaginary boy, Sam, lived down the road under an apple tree. So the playmates of

Miss Lida C. were located in the fence corners around the farm. The little dwarf of Miss Bessie S. lived in a pile of rocks under a thornapple tree.

Miss Julia S. had an imaginary playmate whom she knew as Mary, who would meet her every morning at a certain spot and go to school with her. Mary lived somewhere in an indefinite place up the road that came into Julia's road at that meeting point. In the afternoon, Julia and Mary would come from school together until they reached that spot, when Mary would turn off to go to her own home, while Julia would continue her own road and not see Mary any more until the next day. Sometimes on Saturday afternoons, when Julia wished to play with Mary, she would go down the road to the regular meeting point, when Mary would come to that place and play with her. Mary never came to her house, and she never went to Mary's house.

11. The last case is an example of another feature of this experience which is perhaps the most important of the entire series. In the case of Julia S. she never told anybody else about Mary, at all. It was a repressed idea. The present writer is the first person to whom she has related her experience with Mary. Neither did Rollin R. ever mention to any one, his acquaintance with his little Indian. It is in cases of this kind that we find the greatest injury done to children by parents and teachers. In the case of Mabel B. mentioned above, whose playmates, Fred and her sister, still appear to her, she talked freely to her parents about them. The circumstance distressed her mother very much, and Mabel says that she has often got her ears boxed, and been called crazy, for reporting the sayings and doings of Fred and his sister. So in the case of the grandmother of Phyllis S. referred to above, the friends were confident that the talking to herself, since they knew nothing of the imaginary playmate, the Mermaid, was a symptom of insanity, or something else that was very bad. Hence it was that a course of action was adopted, which brought great distress, if not positive injury to the little girl.

A really pathetic case appeared in the course of these investigations. One day in the class, I had mentioned that the next day we should consider the matter of imaginary playmates, and indicated something of the nature of the topic. The

next day, as soon as that topic was reached, one of the students, Miss LaP, went out of the room, and returned with her mother. At the conclusion of the discussion, Mrs. LaP. came up to the teacher with her eyes shining, and an expression on her face, that indicated the greatest satisfaction, relief, and approval. Then she related her experience. When she was a little girl, she had two imaginary playmates whom she knew as Jessie and Mollie. They lived in a place near a small creek that ran through her father's farm. She would go to see them almost every day, and the visit was something of a ceremony. She always dressed up for the occasion, changing her clothes. They always greeted her effusively, and they parted with considerable ceremony, inviting her to come back soon for another visit. The appearance of the two imaginary girls was very vivid. She could both see and hear them. She had a brother and a sister with whom she might have played, but she preferred to play with Jessie and Mollie.

She thinks that the appearances developed out of make-believe, but they became as vivid as living children would be. Now, after the lapse of forty years, she has a very vivid recollection of exactly the appearance they presented. She never told any one about Jessie and Mollie, until she told her daughter the night before. She was rather ashamed of the experience, and apprehensive that it indicated mental derangement, or something else very bad. She experienced a feeling of the greatest relief when she found that they were natural and normal phenomena, and her face was perfectly radiant when she found that I was interested in her account, and that she could talk to me about Jessie and Mollie without being apprehensive that she would have her sanity questioned.

It is this repression of an idea for many years that constitutes the pathetic feature of some cases of imaginary playmates. What would naturally be an enjoyable and helpful association, becomes something of which the child feels ashamed and conceals it. The unsympathetic attitude of some parents, playmates and teachers, due to ignorance of the nature of this childish experience, is responsible for this feature.

Thus Miss Eva R. had an imaginary playmate whom she called Bertha. Bertha seemed to have something of the relation of an older sister to her. Her association with Bertha was

very helpful, pleasant, and vivid. One time, she told some other real playmates about Bertha. They laughed at her. From that time Bertha disappeared, and was never seen again, much to her own regret.

Another case that is equally pathetic is that represented by Miss Ruth W. Ruth had four sisters older than herself, to whom she was the baby. She had an imaginary playmate whom she called McGunty. McGunty contrasted strongly with herself, having light hair, and being tall, while she herself was short and dark. She could see McGunty very clearly, and could hear her talk. They played keeping house, and made many mud pies. She did not tell her sisters about McGunty, and never talked about her. The older sisters commented upon the fact that she played much alone, and seemed to have such a good time by herself, and would sometimes observe that she laid a second place at her tea table. One day, when she was not observing the fact, an older sister came quietly up to where she was playing with McGunty, and heard the conversation that she and McGunty were carrying on. In great glee, the older sister went into the house and described the conversation. She was quite ashamed of the fact having become known, and McGunty never appeared again. She tried as hard as she could to bring McGunty back, and was very lonesome without her, but McGunty never reappeared. She had formerly told McGunty all her troubles, as soon as they occurred, which was a great relief. She was very unhappy when McGunty went away, and regretted it very much, but McGunty's disappearance was permanent.

Now, what is the explanation and the significance of these experiences of childhood? Are they indications of a diseased mind, or are they real objective existences which are discoverable to the children who have the experience, while invisible to others? There are many persons who will be ready to offer a mystical, mythical, spiritualistic explanation of all these appearances, and whose belief cannot be shaken. The following is a case of imaginary playmate to which the parents of the child have given such a mystical explanation.

Wilma G. is a little girl about five years old. Her twin sister, named Winnie, died at about the age of two. Wilma is very bright, almost precocious, learned early to read, and is a

good speller. She has an imaginary playmate whom she calls Winnie. Almost every day she will report to her mother what she and Winnie have done. She tells her mother how Winnie is dressed, what Winnie says, and describes in detail the circumstances of her activities.

The parents are confident that Wilma sees the spirit of the little dead sister, which is visible to her, but not to other persons, in consequence of the close affinity between the twins. In consequence of the removal of the earth limitations from Winnie, she has progressed more rapidly than other children, and is able to teach Wilma, so that she also progresses rapidly. No amount of argument could, in all probability, convince the parents of the truth of any other explanation.

Of the same general character is the experience of Orla G. Orla has no recollection of ever having seen his father, who died when Orla was less than three years old. Their table is a square table, and was always set for four. When he was about six years old, Orla began to pull out one of the chairs from the table at meal time, and in reply to a question from his mother, said that he pulled it out for his father. Shortly afterward he began to see his father. The visual appearances at first were faint, but gradually became stronger, until he was able to see his father very clearly, and observe him eating. He described the appearance of his father in such a way that the mother said it was an accurate description.

The mother was very much distressed over the circumstances, and talked to him about it. When Orla was about twelve years old, he decided to discontinue pulling the chair from the table, and not very long afterward, the appearances of the father ceased.

It is probable that we have in the phenomena of imaginary playmates, an explanation of all the materializing phenomena of spiritualism that are not deliberately fraudulent. The spiritualistic and mystical explanation collapses at once when we trace the development of many cases of imaginary playmates out of make-believe, and arrange a large number of cases in a series that proceed by infinitesimal gradations from those that are scarcely to be classed as genuine cases of imaginary playmates, to those that furnish spiritualists with their stock arguments.

An imaginary playmate is a visual or auditory idea that becomes as vivid as a visual or auditory percept would be. It is accompanied by a centrally initiated impulse, that is, one which starts in the brain, instead of being accompanied by a peripherally initiated impulse, that is, one which starts in the eye, or the ear, as a percept would be. The centrally initiated impulse that accompanies the experience of the imaginary playmate, traverses the same brain centers that would be traversed by the peripherally initiated impulse, if it were a real child, or other object that is seen. The principal distinction between the idea which is projected as the imaginary playmate, and other ideas is found in the unusual strength of the centrally initiated impulse which accompanies the process. Children generate a great amount of nervous energy, and as a consequence, their centrally initiated impulses are more likely to approximate the strength of the peripherally initiated impulse than are the centrally initiated impulses of grown up persons.

This large amount of nervous energy, and the strong centrally initiated impulse, is one condition for mental capacity. Hence it is that we find nearly all cases of imaginary playmates manifested in children who are distinctly above the average capacity for children of their own age. No stupid child ever had an imaginary playmate. Instead of the experience indicating mental derangement, it is rather an indication of unusual mental capacity.

It will be observed that a very large number of the cases of imaginary playmates are reported by those who have been only children, or who have been compelled to play much alone. But this lonely condition of the child is not necessary for the development of an imaginary playmate. In the cases already cited, it will be remembered that Mrs. LaP. stated distinctly that she had other brothers and sisters with whom she might have played, but she preferred to play with Jessie and Mollie. Also, in the case of Miss Lurah M., there were several children to whom the two boys, Banter and Dedy, appeared in an auditory manner. And then, the complex case of Miss Bertha L. in which several children developed the same group of imaginary playmates, including Mr. and Mrs. Shopey and their white bulldog. All such cases show that while the lonely condition of a child may be favorable to the development of an imaginary

playmate, it is not an essential condition, nor one of very great importance.

Not every child has an imaginary playmate. Investigation shows that about six children out of a hundred have this experience. It is possible that the number is somewhat greater than this, but that is the largest proportion that any accurate counting is able to show. There is always the possibility that some persons may have had the experience, and have forgotten it, but the number of such cases is likely to be very small.

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2. C. H. Cooley—*Human Nature and the Social Order*. Imaginary playmates are referred to on pages 52 and 53. Mr. Cooley seems to think that imaginary playmates arise out of the developing social nature of the child. He fails to recognize that they are vivid, visual appearances, generally originating in the period of infancy, before even the first indication of a social instinct.

3. H. L. Brittain—*A Study in Imagination*. Pedagogical Seminary, volume 14, p. 137. Imaginary playmates are briefly referred to on page 170.

4. Lillien J. Martin—*Ghosts and the Projection of Visual Images*." American Journal of Psychology, volume 26, p. 251-257. Accounts of three persons who saw Ghosts. All showed by experiment a capacity to project visual images. Imaginary playmates are briefly referred to.

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CHAPTER II

PROJECTED IMAGES

In order to understand imaginary playmates, it is necessary that we should examine some closely related phenomena that are concerned in the study of visual images. It was Francis Galton, in 1883, who first called our attention in an emphatic way to the great differences among individuals in the power to visualize, or to remember and to reproduce images of things that have once been seen. Since that time, comparatively little has been done in investigating the differences among persons in this respect, and we have advanced in the knowledge of this capacity only a little way beyond the point at which Galton left it.

Galton spoke of all kinds of visual recollection, or reproduction, as mental imagery, and described three different degrees; high, medium and low. His method of determining the capacity of different individuals was to ask them to image some scene, such as their breakfast table, and to describe it, judging of the degree of vividness that the image presented. It came as a surprise to him that some of his most eminent scientific friends could scarcely visualize the object at all, and had great difficulty in describing its appearance. He was rather inclined to believe that the power to reproduce clearly an object that had once been seen was detrimental, rather than advantageous, to one who had abstract thinking to do.

Galton made no distinction between a visual idea and a projected image. He included projected images under his high degree of visualization, and grouped them with clearly recognized visual ideas. It will be necessary to understand the difference between a percept, a visual idea and a projected image. The distinction can be most clearly made by considering the nervous processes that accompany each of these three mental processes.

When we perceive anything visually, a nervous impulse is started in the retina by the light reflected from the object seen, and this impulse is transmitted through some combination of cells in the sight center of the brain. Such an impulse, started in a sense organ by force from the outside, is called a peri-

pherally initiated impulse. The mental process accompanying a combination of such impulses is called a percept.

If, after having perceived an object, we turn away, or close our eyes and try to think of how the object looked, we are experiencing the mental process known as a visual idea. A nervous impulse is traversing the same combination of cells in the sight center that was traversed before, but in this case, the nervous impulse originates, not in the sense organ, but in the brain itself. Such an impulse is called a centrally initiated impulse. It is seldom so strong as is the peripherally initiated impulse, and the visual idea is never so vivid, under ordinary circumstances, as is the percept.

But sometimes, under extraordinary circumstances the centrally initiated impulse that is transmitted through the brain center, becomes as strong as the peripherally initiated impulse would be; and the accompanying visual idea becomes as vivid as the percept. The centrally initiated impulse may become so strong that it not only goes through the brain center, but flows backward to the retina, producing the same kind of a nervous disturbance in the retina that would be produced by the light waves from an object entering the eye. When such is the case, we experience the kind of a process that may be called a projected image. A projected image, then, is a visual idea that becomes as vivid as a percept would be. It is discriminated from a percept by the fact that it is accompanied by a centrally initiated impulse, instead of a peripherally initiated impulse.

We may also discriminate a visual percept from a visual idea by means of the after image. If we look at an object in a good light, and then shut out the light by closing our eyes, we shall see a representation of the object with our eyes closed. This representation is known as the after image. It arises from the fact that the nervous processes that are going on in the retina when we look at an object, persist for a short time after the light has been cut off. The after image is called positive, if the relations of light and dark are the same in the after image as they are in the object. The after image is called negative, if the relations of light and dark in the after image are the reverse of what they are in the object. If we close our eyes after having looked at a window, and see the

panes light and the sash dark, the image is a positive after image. If, however, under the same conditions, the panes are dark and the sash is light, the image is negative. When we glance at the sun and then close our eyes, we are likely to see a round black spot, which is the negative after image of the sun.

If we look intently at a red spot for a few seconds and then look away at a blank wall or a white object, we are likely to perceive on the wall a green spot of the same shape as the red spot at which we previously looked. This is the complementary image, and depends upon the fact that the light entering the eye finds a condition which gives rise to the green sensation unchanged, while that which gave rise to the red sensation has been partially exhausted.

In the light of the preceding discussion, we may make the following definitions. A vivid sensation is a simple mental process, whose concomitant is the transmission of a peripherally initiated impulse through some brain center.

A faint sensation is a simple mental process whose concomitant is the transmission of a centrally initiated impulse through some sensation center.

A percept is a combination of sensations, some of which must be vivid. It is a vivid process.

An idea is a combination of faint sensations. It is a faint process.

A positive after image is an image accompanied by retinal changes persisting after the light has been excluded from the eye, in which the relations of light and dark are the same as they are in the object.

A negative after image is an image accompanied by retinal changes that persist after the light has been excluded from the eye, in which the relations of light and dark are the converse of what they are in the object.

A complementary image is one seen with the eyes open, in which the color is complementary to that shown by the object.

A visual percept manifests an after image. A visual idea will show no after image. But in cases where the visual idea becomes very vivid, and is accompanied by a centrally initiated impulse so strong that the impulse will flow backward to the

eye and produce a retinal disturbance, there will be an after image, and we may call the mental process a projected image. The projected image, then, differs from a visual idea in its vividness, in the fact that the impulse is very strong, that there is an after image, and that a retinal disturbance occurs. It differs from a percept in the fact that the nervous impulse which accompanies it is centrally initiated while in the percept the accompanying impulse is peripherally initiated.

This discussion has been necessary to make clear the distinctions between the different visual processes, and to understand what an imaginary playmate is. An imaginary playmate is a projected image.

The capacity to project an image, or to project a visual idea is not unusual, but it is far from being universal. Children differ widely in their capacity to project. The method employed to determine whether a person is able to project an image was as follows: The object employed was a Red Seal Dry Cell Battery. The general color of the cell is red, with a white rectangular space on one side, in which is a red, many-pointed star. On this star printed in white letters, are the words Dry Battery, with the word Red in a curved line above, and the word Seal in a curved line below. The battery was exposed to the observation of the persons for two or three seconds, and then they were asked to see it off to one side, out in space, when the object was covered up. If they said they could see it clearly, they were then asked to place their hands over their eyes and try to discover an after image. If they reported an after image, it was accepted as evidence that they had really a projection of the object. Some examples will show the process, as well as some interesting applications of projection with instructive modifications.

Miss Genevra W. was able to project the image of the battery cell out in space very clearly, and described accurately the color and appearance of the object from the projected image. The image was at least ninety per cent as bright as the real object would be, and an after image appeared in about three seconds.

The phenomena are always the same. The image can be projected out in space, it is of different degrees of brightness varying from fifty per cent to one hundred per cent as bright

as the object, an after image is seen, the time of whose appearance is invariable in the same person, but which differs in different persons. In the larger number of persons the after image is positive, but in some cases it is negative.

The presence of the after image is taken as an evidence of the reality of the projection experience. We are so much accustomed to using the expression, "see a thing," or seeing a relation, or any object of thought, that its use in connection with an object of perception whose material figure is not present, is likely to be misunderstood. In the projection of the image, there is a real sight experience. There is a real disturbance of the retina, which does not occur when we merely remember how a thing looked, or when we conceive it, or when we perceive a relation. This disturbance of the retina is evidenced by the after image, and there can be little question that the nervous impulse which constitutes the retinal disturbance is transmitted backward from the brain center. This is the only satisfactory way of accounting for the observed phenomena, and this does not necessarily contradict the Bell-Magendie law.

One example of projection was of such a nature that it led to a line of investigation which seemed at first to promise much. Miss Margaret M. reported that she could see the projected image very clearly and she described it fully. She could read the words on the label, could describe the color, and then in describing the image, remarked that she saw in the image, in the upper left hand corner, a white mark that she had not noticed in the object itself. If she had been describing the object from memory, she would not have mentioned it. She did not know what it was. An examination of the object showed that it was a small white label, bearing the words Size A, and it was seen in perspective, showing scarcely more than a white line.

This experiment, with several similar circumstances reported by other subjects, led to a series of tests based upon the assumption that what was projected was the object that had been presented to the eye. Thus Miss D. stated that when she has read her lesson over, although she has not learned it very well, she is able to project the page of the book out in space, and read from the projected page the words of the text.

Similarly, the testimony of Miss Loretta B. is to the same effect. Miss B. says that she has had only a single case that she believes would fall into the class described as a projected image. On one occasion, she with other members of her class, was required to commit to memory for recitation, a short poem. She neglected her study, but read the poem over without making a really serious attempt to commit it to memory. Being called upon suddenly to recite, she arose in a somewhat bewildered state of mind. While much startled and chagrined, she suddenly saw the page of the book containing the poem projected, and made a brilliant recitation.

A few cases such as those described led to a series of experiments as follows: A person who had been recognized as having the power of projection, was presented with a page of a book printed in large clear type, without any great number or confusing arrangement of lines and sentences. She was asked to look at a single point on the page, without reading the words and then, after a few seconds of looking, to project the page out in space and read the words. The results from several experiments seemed to be very promising, but some very instructive errors occurred. Thus Miss Mary A. was shown the title page of a text book on Elementary Psychology. She then projected the page, and read from the projected image, in the proper place, not the conspicuous words Elementary Psychology, but the words Holy Bible. Students of Psychology do not generally class the two books together in such a way as to form a really close association. Miss A. said that she knew it was wrong, but those were the words which actually appeared on the projected page.

A similar instructive error occurred in the report of a test with the Red Seal Dry Battery, in the case of Miss Eva K. Miss K. projected the image readily, and described it as at least ninety per cent as vivid as the real object was. A positive after image appeared in about three seconds. The words Red Seal occurred on the label in curved lines, and between the word Red above and the word Seal below, Miss K. read the word guaranteed. The word guaranteed does not occur in this place, but it is found in some lines of smaller printing above the seal. The words Dry Battery occur in the place Miss K. described as occupied by the word guaranteed.

Such indications demonstrate rather clearly that the projected image is not a projection of the object, nor of the image on the retina, but of the idea in the mind. There is no possibility of reading from the projected page anything that has not been read consciously or unconsciously when the page was presented to the eye. The results of the experiments in this direction which at first seemed so promising, are merely derived from the fact that all or a portion of the page has really been read, while the subject may believe that the eye has not moved in such a way as to read it.

The only purpose in presenting the object, such as the dry cell in the experiment, is to enable the person to obtain a clear idea that may be projected. After this clear idea has been obtained, it may be projected, time after time, and reinstated after the lapse of a considerable interval.

Any other clear idea may be projected in the same way, even though it be of something that the person has never directly observed, or experienced. Miss Theresa K. states that she has a friend whose image she is able to project at will. She can see her friend as clearly as if the living person were present in the room with her. She described on the test occasion the vivid appearance of her friend, could see how she was dressed, described how her hair was combed, and could see her walk. This projection is most vivid, and most easily obtained when she is alone in her room, although she is not limited to this condition. It is possible for her to project the image of her friend in a classroom where other students are, although not so readily as if she were alone.

Similarly, Miss Eva K. projected and described clearly a room in her house at home, and indicated an indefinite number of minute details, which she testified that she could see as clearly as if she were present in the room at the time.

Miss Edith B. projected the image of her mother, seated in a rocking chair, with her knees crossed, and assured me that the image was as clearly visible to her as the actual living presence of her mother would be. She assures me that what she sees is a really visible, projected image of her mother, not merely a memory of how her mother looked on some particular occasion.

Comparatively few students make use of their power of

projection in studying their lessons. Miss Jean S. states that when she is demonstrating a problem in geometry, she does not depend upon the figure in the book nor upon the black-board, but projects a figure out in space and employs that in making the demonstration. Nearly all the persons who can project an image testify that it is of assistance to them, but they make little systematic use of it. However, Miss Mary A. says that she has rather avoided its use. She has a kind of feeling that it is somewhat improper, or likely to be injurious, or indicative of a mental tendency that is not to be talked about in public, but rather to be concealed. Her capacity to project is rather high.

Some teaching methods appear to have been devised by some teacher who has a capacity to project, apparently in the belief that this power is universal in children, or may be cultivated until every child can project. When such methods are employed in classes that are not especially selected, it will be found that some children are bright and shining lights, capable of being employed to demonstrate the revolutionary character of the teaching methods. These children may be paraded at teachers' meetings to the amazed wonder of less fortunate teachers whose children show by other methods no evidence of approximating the wonderful ability of the show pupils. But it is likely to be the case that a large majority of the children left at home are not so responsive, and must be ranked with the lower incapable, common herd. The methods that demand a power of projection are not likely to be suitable for a very large proportion of the children.

The number of persons who have the capacity to project an idea, while large in the aggregate, is not proportionally very great. A casual inquiry of any large class, after an explanation of what is meant by projection, will elicit a response of about thirty per cent. The actual results, obtained by careful tests, show about three per cent. The actual number probably lies between the two estimates. I have obtained positive results from about half as many persons as have reported the experience of imaginary playmates. It seems probable that the number of cases among grown up persons is much less than in children.

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CHAPTER III

IMAGES IN READING

The explanation of projected images in the preceding chapter not only discloses to us the real nature of imaginary playmates, but contributes to our understanding of a series of closely related phenomena which we may know as Images in Reading. The experience is one which is manifested in a comparatively small number of persons, but is of great importance in several directions. Some persons experience a series of projected images of the events as they are reading, and get the meaning of what they read by means of these projected images.

The most difficult thing in teaching reading is to cause the children to get an adequate meaning from what they read. The words may be perfectly meaningless to the children, and may cause no thought to originate in their minds. Such reading is, of course, of no value as reading, and the child derives no benefit from it. Pronunciation of the words, inflection, emphasis, expressive utterance, all are worse than useless, unless these qualities are the expression of thought aroused in the mind.

The nature of meaning is not very satisfactorily determined. Some persons who are extreme advocates of what has been described as the muscular movement theory of consciousness, assert that the meaning is the muscular movement that accompanies the perception of the words. The muscular movement that this theory contemplates, may be the movement of the muscles of the arms, or exterior parts of the body, but it is generally the movement of such muscles as those of the larynx, the vocal organs or the internal organs of the body. This theory of meaning, however, has very little to commend it, to any one who is not obsessed with the theory that all consciousness is motor, and that we think with our muscles instead of with our brains.

The meaning is something associated with the recognition of the words, but it is different from them. Words have no meaning unless they are associated with something already known. Meaning comes as the result of association, and it depends upon the recognition of the relation between the ideas that the words express, and some previous experience. Differ-

ent words have different meanings and different shades of meaning, dependent upon the mental processes which are caused to arise in the mind as a result of the recognition of the words. Hence we may say that oral reading is the expression of the thought that is aroused in us by the words on the printed page.

Different persons have different methods of making the associations that constitute the meaning of what is read. With a small number of persons, the meaning consists of a series of visual pictures projected out into space, or appearing in some definite position on the page that is read. Thus the following accounts, brought out by careful questioning and comparison with the experience of others, will indicate the manner in which some persons obtain meaning from what is read.

Mr. Ralph E. reports that he projects images of the scenes of nearly everything that he reads. The images appear as a succession of scenes which, while they are decidedly real, are less vivid than the real objects would be. If he is reading *Hia-watha*, a succession of scenes appear that are about as vivid as the real scenes would be if they were seen in the late dusk of the evening. His estimate is about fifty per cent as bright as the real object would be.

In the scenes appear all the primary colors. If he were reading about a field of clover, or any scene in which clover is mentioned, he would experience the sensation of clover color. When he is reading about a baseball game, he projects the movements of the players, and the entire game is enacted before him. He has no image for relation words, but the story of what he is reading appears before him in visual scenes.

These visualized scenes belong to the same group of phenomena as do the projected images described in the preceding chapter, and whenever the test is made, an after image appears. Miss Avis R. visualizes everything that she reads, and the projected images follow one another along the line of her reading, just above the top of the line. There is no color in the images, but they appear to be at least fifty per cent as bright as the real scene would be. There is a negative after image that appears whenever she makes the test for it by closing her eyes.

The definite location of the images which Miss R. describes,

occurs in many cases of projection in reading, but it is not universal. The following account presents in the clearest possible way, the extent to which this power of visualization in reading may go.

Miss Clarissa F. visualizes everything that she reads. In reading *Hiawatha*, she sees clearly the scenes and the characters of the story. The images that she sees do not appear as pictures, but seem to be real objects, full of color, and quite as vivid as the real objects would be. She feels herself to be in the midst of them, and the images are vividly real and all around her. She dislikes to have pictures in books, because they do not correspond to her images, and are not so vivid and beautiful as those which she projects. She prefers reading a book to going to a moving picture show. In fact, she rather dislikes to go to the movies, because she can more easily enjoy a better show of more brilliant and more beautiful pictures by reading a book at home.

In the case of Miss Avis R. referred to above, mention is made of the fact that the images are seen with reference to the lines of print that are read. In many cases, the images are not definitely located, but in some examples their location can be definitely described. Miss Grace L. reports that she seems to interpret all her reading by means of the projected visual images of the ideas which she reads. When she is reading *Hiawatha*, she sees a succession of images that shade into one another. The images are seen, not as pictures, but as real objects would seem, and are always in front of her. Miss L. says about four feet in front of her, but her answers to other questions indicate that her conception of measured distance is rudimentary. The images are located with reference to the person and not with reference to the page. The visualized images are at least fifty per cent as bright as the real objects would be.

Miss Mildred M. also visualizes everything that she reads, and the succession of pictures that she projects is located at the top of the page.

When the images are not located with reference to the page, they are more likely to be represented as real objects than as pictures. When the projected images are conceived to be real objects, they are located somewhere out in space, and

the person is likely to have the feeling of being in the midst of the scenes. In some such cases, the background on which the images are projected is some locality with which the person is already familiar.

An example of the last characteristic is the case of Mr. Robert T. Mr. T. projects images of the situations in almost everything that he reads. The images are not pictures, nor illustrations, but images of real things with color and movement of the characters. These images are very nearly one hundred per cent as bright as the real objects would be. They are not located with reference to the page of the book, but seem to be located out in space. Associated with nearly all the projected images of the reading, is a background of a single familiar locality. They seem to be projected upon a background of King's Flats, a definite Ypsilanti situation.

Very similar is the testimony of Miss Helen H. Miss H. visualizes everything that she reads, and she reads very slowly in order that the pictures shall have time to pass along. She does not like to have pictures in books, because the illustrations are not likely to agree with the scenes that she projects, and when they do not, she does not like the book.

The images that she projects do not seem to be pictures, but seem to be images of real things, or objects that she perceives. She estimates that they are at least seventy-five per cent as bright as the real objects would be under the same conditions.

The images that she projects are likely to be associated with familiar localities. If she is reading a story in which a river is mentioned as one of the circumstances, the river that would appear in the projected images would be the Huron River, with which she is familiar. In reading, she loses the consciousness of the words, and watches the changing scenes as they are projected.

It is highly interesting to listen to the testimony of a person who has two methods of getting meaning from his reading. Mr. Lloyd G. reports that when he is reading, he is not conscious of the words of the book, but is conscious of looking upon a continuous series of scenes. They are not pictures, but scenes of real objects that he projects. They seem to be in the

distance, and are rendered small by perspective. They seem to partake of the nature of miniature scenes.

Mr. G. likes to have pictures in books, especially pictures of the characters of the story. He sees the characters that are pictured in the book, but in his projected images he sees them in a wholly different setting. His own characters seem to have no distinguishable faces, but they take on the faces represented by the pictures in the book. The projected scenes are about seventy-five per cent as bright as the real scenes would be.

Mr. G. finds it difficult to read technical works, because it is hard to project, or picture, the things told about there. He has two ways of reading; one by means of projected images and one without. The second method is very laborious and slow. He is somewhat at a loss to understand how some persons can enjoy reading at all without the capacity to picture the incidents in visual form.

Miss Marguerite S. projects images of almost everything that she reads. The images are extraordinarily vivid. She believes that they are one hundred per cent as vivid as the real objects would be. The objects appear in their natural colors, and are not the colors of pictures, but visual projected representations of real objects, with their motions, colors, and she even listens for the sounds that they make.

Miss Evelyn B. also projects images of what she is reading about. These images are in their natural colors, and fully one hundred per cent as bright as the real object would be. The images are not located with reference to the page, but they seem to be all around her, and she seems to be living in the midst of them. She dislikes to have pictures in books, because the pictures do not agree with her projections, and the discrepancy makes her feel uncomfortable.

Miss Irene S. projects images of the scenes and characters of the story that she is reading, and these projected images are at least seventy-five per cent as bright as the real objects would be. They seem to be some distance away from her, and there is considerable color in the images. They contribute a great deal to her enjoyment of what she is reading, and she believes that she would not enjoy reading if she could not see the images of her own projection.

This capacity to project ideas of what she reads is of much service to her in arithmetic. Whenever she is asked such a question as "A man had seventeen cows in one pasture and eight in another. How many cows did he have in both?" she sees a group of brown cows in a square pen, moving around and feeding, and a similar group in another pen.

Words that express relation have their projected counterparts as truly as do words that represent material objects. The word *of*, for example, presents a picture of two words with something between. So the relation words are all of them represented by some kind of a visual projected image.

The above discussion represents the general tendency of the description of the process of projecting images from reading, as it is illustrated in twenty-one cases that have been studied. These twenty-one cases have been collected from about eight hundred students, but the proportion must not be considered representative. The census is far from complete among this number of students. The probability is great that twice the number of cases might have been collected.

These cases represent examples of visual projection. No attempt was made to study the reading of those who obtain the meaning of what they read by visual ideas which are not projected. Many persons obtain the meaning of what they read by means of visual ideas that are not projected, some by means of auditory projection, and still others seem to obtain meanings in ways that are neither visual nor auditory.

CHAPTER IV

HALLUCINATIONS

The subject of hallucinations has attracted a great deal of attention ever since the mind of man was turned to the study of his own mental experiences. Many volumes have been devoted exclusively to this one topic, and hundreds of articles may be discovered by turning to the files of psychological magazines.

Hallucinations constitute one of the psychological topics that are of perennial interest to the non-psychological reader. They furnish the basis for ninety-nine per cent of all ghost stories, and constitute the determining factor for many historical events of world wide importance. The justification for introducing a discussion of such a well known topic in this place is the fact that they belong to the same category as do imaginary playmates, projected images, and images in reading.

A hallucination is a mental process which is accompanied by a centrally initiated impulse as strong as a peripherally initiated impulse would be under the same circumstances. It is an idea that becomes as vivid as a percept. We distinguish a percept from an idea by its greater vividness; and when an idea takes on an unusual vividness, we are unable to distinguish it, and consequently believe that we experience a percept. Hence it is that we rarely discover that we have experienced a hallucination. No doubt, many persons really have the experience without knowing it.

Any condition that induces an unusual strength of a centrally initiated impulse in the brain is likely to be favorable to hallucinations. Any condition that induces inflammation of brain tissue, such as the condition that occurs in cases of brain fever, delirium tremens, or maniacal insanity, is likely to be accompanied by hallucinations.

So, also, children and young persons, are more likely to experience hallucinations than are older persons, since they generate nervous energy in excess. No doubt, little children experience a very great number of hallucinations, and the life of a little child is a constant struggle to distinguish hallucinations from actual percepts.

We shall need, for our study, to distinguish a hallucination

from a closely related experience that is often confounded with it, that is, an illusion. We can best make the distinction clear by reference to the nervous impulses that accompany them. In a hallucination, there is no peripherally initiated impulse. The impulse is altogether centrally initiated. A common way of describing this is to say that in a hallucination we see something when there is nothing to see. In the case of an illusion, there is a peripherally initiated impulse, but it is carried to the wrong brain center. There is something there to see, but we see the wrong thing. We do not see the thing that is there, but we see something else.

With this distinction, we can examine some examples of hallucinations with great profit. As an example of a typical hallucination, we may consider the following: Miss Edna P. was staying all night with a friend whose father, as well as the rest of the family, had gone away. The two girls were alone in the house, and slept late the following morning. About ten o'clock, Miss P. got up and went into an adjoining room, when she saw her friend's father standing at a wash stand washing his hands. He looked at her and smiled. She went back to her friend and told her that her father had returned, which surprised her friend very much. They went back to the room to see him, when he could not be found, and there were no indications that any one had been there. The friend's father returned the next day.

This is a good example of a hallucination. Miss P. was fortunate in the conditions being of such a nature that the hallucinatory character of the experience was easily discovered. If the father had been dead, or died soon afterward, there would have been a strong tendency to assert that the appearance was connected with the fact of death. The appearance would have been explained as a ghost, or a materialized spirit. A slight tendency toward mysticism, or spiritualism, would have adduced it as indubitable evidence of the existence of a separable astral body. But under the circumstances, there can be little disposition to adopt a mythical, mystical, supernatural explanation of the event, especially in the light of our preceding studies of projected images, images in reading, and imaginary playmates.

A similarly clear case of hallucination, uncomplicated by

any contributory circumstance is seen in the following: Miss Mabel B. was one day walking with a friend from the Normal School building to the Science building between classes. She met a little boy with a blue cambric waist and corduroy trousers. The boy passed her on one side, stepping off the sidewalk to do so. Almost as soon as he had passed, Mabel asked her companion, Mrs. McC, what that little boy was doing there at that time in the day, and turned around to look again at him. There was no little boy there, and Mrs. McC assured her that no little boy had passed them, or was present at the time.

This case is instructive from the fact that it occurred in bright daylight, with other persons present. There was nothing confusing nor mystical about the entire experience, and no temptation to give it a supernatural nor mythical interpretation.

Both of the preceding examples have been cases of simple hallucinations, in which the hallucinatory experiences involved persons. But hallucinations are frequently much more complex, and are not limited to appearances of persons. Miss Phebe C. reports that one afternoon she was standing at the gate by her house, looking toward the northwest. In front of her she saw a large house surrounded by a big fence, and in front of it a large suspension bridge. The appearance was very clear and definite. The background toward the northwest consisted of a mass of trees and shrubs. The image disappeared in a few minutes.

On another occasion, when she was about nine years old, she was hanging upon a farm gate near the back of her house. She was looking up into the sky, and she saw near the zenith, a number of trees somewhat enclosing a small lake. Behind the trees she saw a deer come out running away from three hunters on horseback. The deer ran through the pond and escaped. At least, she did not see the hunters catch the deer.

The general characteristic of a hallucination is the fact that it occurs a single time, and there is no regular periodic recurrence of the experience. It is this fact more than any other that induces a belief in the reality of the perception. Cases of imaginary playmates are not hallucinatory, because by continued repetition, the children come to recognize that the playmate, despite its vividness, is not a real, living child.

But the single instance of any particular hallucination does not permit a comparison of one experience with another, and there is little opportunity to correct the false perception. Consequently, a hallucination is generally believed to be a real percept, or a perception of a real thing.

However, there are cases of recurrent hallucinations. Thus Miss Fay P. frequently sees a cat, which is usually black, but may be of other colors. The cat is generally seen on the floor, nearly in front of her, so that she feels herself in danger of stepping on it. The appearance never lasts more than half a minute, and very quickly disappears when she looks directly at it. She does not remember when the cat first appeared to her, but probably as early as she was able to remember anything. It now appears to her perhaps once in three months.

Somewhat similar is the experience of Miss Hazel S. who reports that she experiences the hallucination of a woman in a black dress, passing outside of her sitting room window. The person is a stranger, and investigation invariably shows that no person has passed the window, nor is there any one in sight when she undertakes to investigate. The experience began when she was about fifteen years old, and then it occurred almost every day. She sees it occasionally yet, the latest appearance being about six weeks previous to this report.

In the last two cases there is very little distinction to be discovered between such a hallucination and an imaginary playmate. The recurrence of the event leads to a recognition of its non-real character, and a disbelief in the veridical nature of the experience. This is one of the principal distinctions between the imaginary playmate and the hallucinatory experience.

The distinction between a hallucination and an illusion is the fact that there is a real objective basis for the illusion, while there is none for the hallucination. But in some cases even this distinction becomes obscured, as in the following instance. Mrs. May W. reports that when she was a little girl, one day she was lying on the floor looking at some plates in a fashion magazine. Suddenly, two of the lady figures in the plates walked out of the picture into the room and disappeared. She called to her mother inquiring where the two ladies had gone, and searched for them a long time without finding them.

Somewhat similar is the report of Miss Laura McN. Miss McN. says that her father died before she was born. There was an enlarged picture of him hanging at the foot of her bed in her room. One night, when she was in bed, and much troubled over some circumstance of the day, her father walked right out of the picture and took on the size of a man. She was frightened at first, but gradually became less so. Her father talked to her and comforted her. Since that time, she has frequently seen her father and has consulted with him when she was in trouble. She disclaims any belief in spiritualism, and knows the distinction between her father's appearance and that of a living man.

In this case we have a peculiar combination of an illusion, whose material basis is the picture, an imaginary playmate, recognized in the habitual character of the experience, and a hallucination. It is of the kind, too, in which certain types of mind would revel in furnishing a mystical explanation of the circumstance.

Another illustration of the close relation between hallucination and illusion is found in the experience of Miss Katherine D. Miss D. was one time talking to a woman at her own home. Suddenly, the woman changed into a skeleton, showing the appearance of the articulated bones. Miss D. was very much startled, but reached out her hand and touched the woman, when she immediately changed back again from a skeleton to a woman.

There can be no explanation of such an experience as this, and in fact none is needed, except that for some unexplained reason, the nervous impulse, established in the retina, had ceased to pass through the combination of cells in the brain that corresponded to the appearance of the woman, and had switched off to the combination that corresponded to the appearance of the skeleton.

It was intimated above that little children are more susceptible to hallucinations than are grown up persons. This must be associated with the fact that children generate nervous energy in large amounts, in excess of the demands made upon it by the bodily activities. They would neither play, nor grow, if they did not. Hence we shall find that children experience hallucinations as naturally as they play or grow, and

for the same reason that we find in children the phenomena of imaginary playmates.

We fail to consider the hallucinatory experiences of children as much as we ought to do, principally because the children themselves do not recognize their hallucinatory character. They cannot testify to their experiences, except by their actions. It is impossible for us to inquire systematically of a baby, "See here. Will you kindly tell me whether you experience hallucinations or not?"

But in many cases we can discover that children have experiences which we can interpret and understand only if we are acquainted with the nature of hallucinations, and if we have them in mind as possible explanations of children's actions. The following case will indicate the highly necessary character of the knowledge of hallucinations if we are to deal justly and wisely with children.

Miss Clare O., when a little girl, went to bed one night, in a dark room. Suddenly the room seemed to be illuminated brightly, although no source of illumination was apparent. In the light she saw two figures, like Brownies, fantastic creatures of rainbow colors, and very animated. They pointed at her and laughed and talked, although she was unable to hear their voices. She screamed, and her aunt came and took her into the next room where it was quite light. Her aunt placed her on the arm of a chair, and the two figures (Miss O. did not use the word Brownies) perched upon the other arm and looked at her and laughed.

In some such experience as this, we find the explanation of the fears and terrors that many children manifest. If the children could tell us what they see, or if we had sufficient knowledge of the facts of hallucinations, we should be able to deal more wisely than we now do in many cases, with children.

In all the cases adduced as examples of hallucination above, the experience has been a visual one. But hallucinations may occur in any sense, and may be of hearing or touch, or of other kinds. The following examples will illustrate hallucinations of hearing:

Miss Lulu M. reports that she has often heard her mother calling her, and has heard her mother make some remark when she was far distant from her. On several occasions she has re-

turned home from a distance of two or three blocks, asking what her mother had said, only to find that the entire experience was hallucinatory.

Similarly, Miss Mabel B. was studying in her room when she distinctly heard her mother call her. She went out into the hall, opening the door to do so, but no one was in the hall. Then she went down stairs and asked of the family living in the house, where her mother was. She was assured that no one was present in the house except the immediate family, and that her mother had not called her.

In these cases, the impulse of exaggerated intensity had traversed the brain centers in the region for hearing rather than in the more common one of sight. So the hallucinations may be observed in any sense, although sight and hearing are the more common.

In all cases of hallucination heretofore adduced there can be no supposition of any disease, present or prospective, physical or mental. A hallucination is not an abnormal experience, nor is it indicative of disease of any kind. However, where there is a diseased condition of the brain that is accompanied by inflammation, hallucinations are likely to occur. Brain fever and delirium tremens are nearly always accompanied by hallucinations.

Miss Ethel K. reports that one day she had the unusual experience of hearing a band of music all day. The band played no recognizable tune, but all day there were strains of beautiful music heard. The experience was very pleasant, and she enjoyed it very much. Soon afterward, she had a spell of typhoid fever. It seems rather likely, in this case, that the hallucinatory audible experience of the music was associated with the oncoming of the disease.

A less pleasing experience associated with disease is of the kind reported by Miss Gertrude P. Miss P. was suffering from nervous prostration induced by overwork. While lying in her bed, she would frequently see various friends of hers assuming strange attitudes and grotesque shapes. They would appear to her to be dancing upon the window sills and perched upon various parts of her bed. Various kinds of animals would appear to her as different kinds of religions, and would demand that they be worshipped. There is no limit to the kinds of hal-

lucinations that may accompany disease, but hallucination must not be considered as essentially indications of present or oncoming disease.

The phenomena of hallucinations have attracted the attention of investigators for a long time, and a whole library of books has been written upon the subject. In European countries an investigation was undertaken many years ago to discover how many persons had ever experienced hallucinations, and the same kind of an inquiry was carried out in the United States by Professor James. The result showed that about ten per cent of all the persons who answered the inquiries had had the experience. Also, it was found that the greater number of cases of hallucination reported, had occurred when the persons were young. More persons had experienced hallucinations between the ages of fifteen and twenty, than between the ages of twenty and twenty-five. More had experienced hallucinations between twenty and twenty-five than between twenty-five and thirty, while the number of hallucinations decreased as the persons grew older.

If it were possible to secure an accurate report from younger persons, it would probably be found that the number of hallucinations rapidly increases as the age becomes less. It is nearly certain that all persons have experienced hallucinations, especially when they are very young children. The reason why so small a number of persons report the experience is because the hallucinatory character of the experiences has not been discovered. Unless a person discovers that the thing he really saw was not there to see, he would never report it as a hallucination. Only those hallucinations that are discovered can be reported. Also, it is extremely probable that many of the hallucinations that are experienced in early childhood, are forgotten.

In my own inquiries, I have found that about thirteen per cent of the persons have recognized experiences as being of a hallucinatory character; but this does not prevent the conclusion that all persons have, or may have had hallucinations.

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backward flowing impulse, on p. 131. He describes a hallucination as a true perception, but makes rather a difficult meaning for perception.

2. Parish—Hallucinations and Illusions. Contemporary Science Series. Chapter 3, p. 77-109. Especially devoted to a report of the International Census of Hallucinations, classifying them according to various characteristics. Footnote on p. 65 says children are especially susceptible to hallucinations. On p. 109, says hallucinations are very quickly forgotten. His theory of the nature and the cause, as well as his definition of hallucination, is very obscure and involved.

3. Boris Sidis—Nature of Hallucinations. Psychological Review, volume 11, p. 15-104. A long, technical, and involved paper. Discusses the nature of perception, and says that hallucination is a secondary perception.

CHAPTER V

NUMBER FORMS

It was Francis Galton who first called our attention in an emphatic way, definitely to an experience that many persons have, but which many others do not have. This experience has come to be known by the name of number forms, and consists of a definite way of thinking of the series of ordinal numbers. This can best be explained by a description of a few examples.

Miss Ethel G. always thinks of the numbers from 1 to 100 in a definite form. The numbers from 1 to 15 run in a series of three curves joined to each other in a general horizontal direction from left to right. She sees the numbers 4 to 10 crowded together, while the others are more widely spaced. Then the form turns vertically upward in a sharp curve carrying the numbers 16 to 20. From 20 to 40 the numbers are arranged in a line nearly horizontal, running toward the left, approximately parallel to the line 1 to 15. From 40 to 60 the figure makes a round turn upward, and the numbers 60 to 100 are borne on a vertical extension of this line.

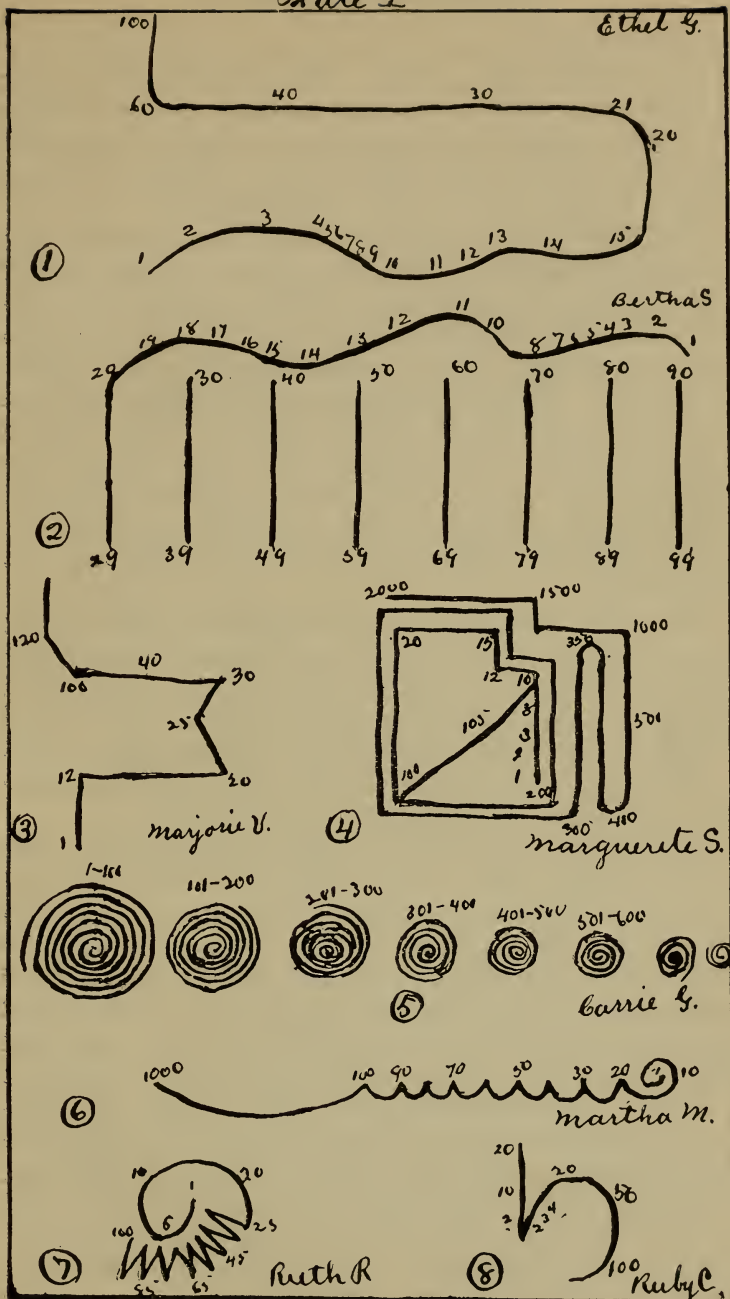
There are two facts to be observed in the description of such a figure. The first fact is that when we say a person sees the numbers arranged this way, we mean that he has a visual idea, not a projected image, of these numbers. In no case of the 67 examples which have been collected for this study has any one described the figures as being projected. The second fact to be considered, is that, although in our description we may use the phrase that the line runs so and so, and bears the numbers, this phrase does not necessarily mean that there is an actual line apparent in the figure. In some cases, the lines actually appear; but in many other cases, the figure consists of an arrangement of the numbers in a certain sequence to each other, and the figure is drawn on paper, by making lines that connect the positions of successive numbers. In Miss G.'s case, there are no lines in the figure, but the numbers are arranged in such a position that the line connecting their positions will assume the shape indicated in the diagram.

Another figure will also be very instructive. Miss Bertha S. always sees (has a visual idea of) the numbers arranged in a well defined form. It consists of a series of curves extending

DESCRIPTION OF PLATE I.

- Fig. 1.—Number form of Ethel G.
- Fig. 2.—Number form of Bertha S.
- Fig. 3.—Number form of Marjorie V.
- Fig. 4.—Number form of Marguerite S.
- Fig. 5.—Number form of Carrie G.
- Fig. 6.—Number form of Martha M.
- Fig. 7.—Number form of Ruth R.
- Fig. 8.—Number form of Ruby C. Note the two branches.

Plate I



from right to left in a generally horizontal direction, and carrying the numbers from 1 to 19. From 20 to 29 the numbers are borne on a vertical downward extension of the preceding line. Other numbers to 100 are borne on vertical lines parallel to the line from 20 to 29, with the tens multiples at the top and the 9's at the bottom. 100 is nearly below 1.

The definiteness of a number form is well illustrated by that of Miss Marjorie V. Miss V.'s number form begins with 1 at the bottom of a vertical line, and the numbers extend upward to 12. Here the line turns to the right, not quite horizontal, but ranging slightly upward carrying the numbers from 12 to 20. Thence it turns upward and slightly backward to 25. Then changing its direction slightly forward toward the right, only five or ten degrees from the vertical, it continues to 30. Then it runs toward the left, horizontally to 100 nearly above 12. Thence it turns 45 degrees upward to 120. From this point the numbers run indefinitely upward in a vertical direction.

The above examples may be considered fairly typical, neither the most complex nor the most simple. Many persons have number forms in which the numbers are arranged in a single straight line running vertically or horizontally, toward the right or toward the left, or directly forward from the person. But there are examples of number forms of a bewildering degree of complexity in three dimensions of space.

One of the most complex is that of Miss Carrie G. who sees the numbers from 1 to 100 borne on a conical spiral of ten turns in which she is enclosed. 1 is at her left about on a level with her waist. Then the spiral lines run toward the right, clockwise, and 10 is just above 1. The turn of the spiral that bears the numbers 10 to 20 is just above the first one, and the turns of the spiral continue upward becoming smaller and smaller, until the last turn is just above her head with 100 at the center. The numbers from 101 to 200 are borne on a similar spiral, about four feet in front of her, and the turns of the spiral are smaller. The other numbers are borne by hundreds, each hundred on its corresponding spiral in front of her, and each spiral becoming smaller than the preceding, and separated from it by a greater distance. Beyond 1,000, the numbers run straight away from her in an indefinite straight line.

Another kind of complexity is illustrated by the number form of Miss Marguerite S. This form is rendered even more complex by the fact that there is a duplication of the same succession of figures for the higher and larger numbers. One series of numbers from 1 to 9 occupies a vertical line at the beginning of the figure, with 1 at the bottom and 9 at the top. The continuation of the line terminates at 10. The figure then makes a square turn to the left to 12, then turns vertically upward to 15, then turns to the left to 20, thence downward to 100. From 100 the numbers to 109 are carried on an ascending line joining the first at 9. The figure then duplicates the first part to 200 and is almost a repetition of the first part to 300. Then the figure turns upward to 350, downward to 400, upward again to 500 continuing to 1,000, then almost a repetition of the first part again to 1,200, 1,500, and 2,000.

Mr. Robert T. has a number form that consists of a definite arrangement of figures and mathematical characters scattered promiscuously over a surface. He says this arrangement is definite and permanent, and he is able to reproduce the same arrangement at any time. In a test, he did write two copies exactly alike, writing the second without any reference to the first. Whenever a number or operation is mentioned, Mr. T. always sees the corresponding character or process represented in this figure.

No explanation can be offered why the persons see or think of numbers in these several ways. No one is able to make any suggestion why the number forms assume the shapes that they do. No one is able to record the process by which a number form began, and in some cases, the person does not know that he has a number form until his attention has been called to it by an inquiry. However, much the larger number of persons who have number forms are quite surprised when they are informed that other persons do not have number forms, or think of numbers in a different way.

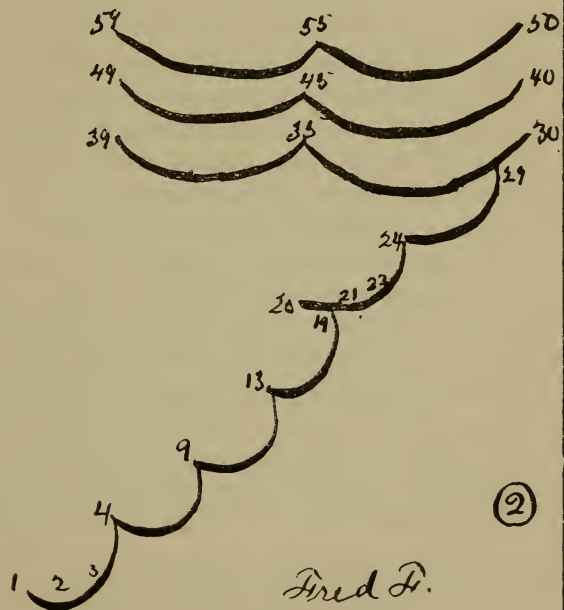
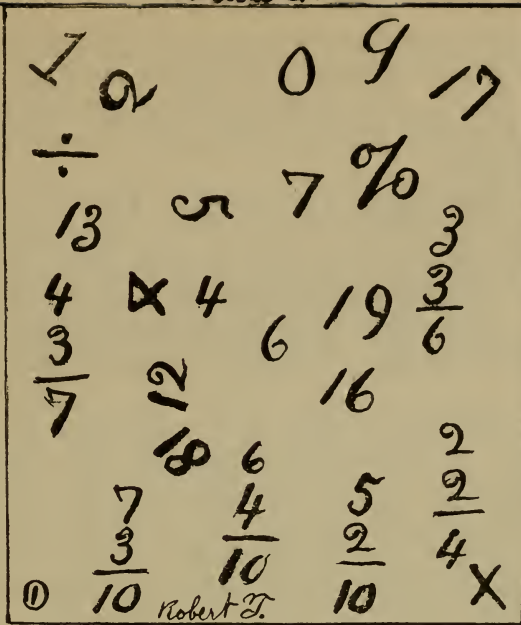
Almost the nearest suggestion of the beginning of a number form is derived from the testimony of Miss Martha M. Miss M. has a number form that begins with a spiral of two turns at the right bearing the numbers from 1 to 20. The other numbers to 100 are borne on a series of semicircles joined to each other with the convex side downward, each semicircle car-

DESCRIPTION OF PLATE II.

Fig. 1.—Number form of Robert T.

Fig. 2.—Number form of Fred F.

Plate II.



rying ten numbers, and each becoming smaller than the preceding, so that the entire series constitutes a straight horizontal line toward the left. The numbers from 100 to 1,000 are borne on a large semicircle continuing the direction of the smaller units of the series.

Miss M. first learned to count to 20. When she started to school, she got a whipping because she could not count farther than 20, so she knows that the figure did not extend beyond 20 at that time. She supposes that she had the spiral part of the figure then. In the figure, she seems to be located at the point that represents her age. Beyond her age, the figure extends to the left.

The number form of Miss M. is interesting for another circumstance. In Galton's book, "Inquiries Into Human Faculty," is published a number form almost identical with it, and in an article by Mr. G. T. W. Patrick, in the *Popular Science Monthly*, in 1893, is another that is very similar. That there should be published three number forms of such a complex nature so closely similar is certainly a coincidence.

In the case of Miss M. it will be recognized that there is a definite relation between the number form and the position of the person. The number form occupies a definite location with reference to her body. In many cases we find that the same relation exists. In another case mentioned above, that of Miss Carrie G., the person was included within the turns of the spiral. So in the figure of Miss Florence S., the number form begins with 1 at her right and below her waist, runs upward and across until 10 is directly in front, then turns upward and backward reaching above her head on the left side at 20.

In a very few cases we find two branches to the number form. Miss Ruby C. has a number form that begins at a point about a foot in front of her, as high as her shoulder. The first branch runs directly upward, and bears the number 1 to 20. The second branch begins at the same point as the first, curves around toward her right getting farther from her as it proceeds. This branch bears the numbers from 1 to 100; the 1 to 20 being duplications of the numbers on the first branch. 100 on the second branch, which does not appear on the first, is about an arm's length away from her. This second branch is

curved so much that the numbers above 100 are lost, as if they had got beyond the range of her vision.

Similarly Miss Hattie M. has a number form with two branches, although this character would not be discovered by simply looking at the figure. Miss M. says that the figure begins at 7 and runs both ways, 7 is the starting point in all her number conceptions.

In some cases there are features of the number forms that distinguish it clearly from the common experiences. Thus Miss Ida F. has a very simple number form, consisting of a broken line somewhat ascending from left to right in a series of steps of unequal value. The numbers from 4 to 8 are dark. 14 to 20 are light. 13 is dark. Very much the same is the report of Miss Irene S., who has a simple number form, the special peculiarity of it being that in the various parts of the figure there are variations in the brightness of the line, and the numbers located along it. The numbers 1 to 7 are dark, then the figure gradually grows lighter until about 40, when it darkens. From 40 to 56 there is a curve, and from 70 onward, the figure gradually becomes darker.

The testimony of nearly every one concerning the number forms is that they are very helpful, not only in remembering numbers, but in making computations. The testimony of Mr. Fred F. will be found representative of much the larger number of those who have number forms.

Mr. F. has rather a complex number form. The numbers from 1 to 19 are located along a series of four curves ascending from the left toward the right, joining each other at sharp angles. 20 does not follow 19 directly, but is located at the end of a curve which begins about one number to the left of 19, and extends toward the right. A series of two curves still ascending toward the right carry the numbers from 20 to 29, with 24 at the angle of junction. 30 to 39 are carried on two curves nearly horizontal joining the preceding curves at 31 and extending toward the left, with 35 at the angle of junction. 40 to 49, 50 to 59, are on double curves parallel to that of 30 to 39.

Mr. F. is a mathematician of high rank. He has carried his mathematical studies far beyond the point at which most students stop, and his opinions concerning the utility of num-

ber forms are of decided interest. Asked if the number form was of any particular value to him, he replied that he made constant use of it, and he was unable to understand how persons lacking a number form could carry on mathematical computations at all.

The testimony of other persons is almost invariably the same. Miss Lucile A. says that she does not know how she could learn arithmetic without her number form. Miss Vira F. states that it is of much help to her in arithmetic, and she can think of numbers in no other way. If she were deprived of it, she thinks it would be very difficult for her to calculate numbers at all. Miss Marjorie V. believes this figure is of considerable assistance to her in remembering numbers, although she does not use it in computation. Miss Georgia F. says that she has had her number form "always," and it seems to be some advantage to her in arithmetic, although not a great deal. Miss Ruth R. says that she does not know why she sees numbers in this way, but she always does so, and the form is of considerable assistance to her in her number calculations. Miss Martha M. states that her number form is of much assistance to her in addition and subtraction.

A very few persons assert that the number form is of no value to them. Thus Miss Lillian W. does not believe that her number form is of any assistance to her in arithmetic or computation, although she always sees the numbers in this definite way. Miss Genevra W. has a number form, as do her father and her brother. Her father is a very skillful mathematician and her brother is also proficient. She herself has studied mathematics, even taking trigonometry as an optional subject in the high school. Nevertheless, she has no love for the subject and considers herself a poor mathematician. She believes that her number form is a detriment to her in learning mathematics.

It is difficult for a person with no number form to understand what is meant by a number form, and how it is employed in making calculations. The testimony is that whenever a person who has a number form hears a number mentioned, he immediately sees or thinks of the number in its proper position, in the figure, and always in its proper relation to the other numbers. In making computations, Miss Lucile A. testifies

that if she were asked to multiply two numbers, such as 7 and 8, she would see the 7 in the figure, and then she would see the 8, and would know the product by its location in the figure. This is about as much of a description of the process of using a number form as one is able to give.

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CHAPTER VI

MENTAL CALENDARS AND ALPHABET FORMS

A phenomenon very similar to that of number forms is found in Mental Calendars. Some persons have a definite, fixed method of imaging the months of the year and the days of the week. They are unable to explain the origin or the occasion for these mental calendars, which are generally more or less useful. An examination of a few cases will disclose the general nature of the phenomena.

Miss Minna W. always sees the months of the year located on a vertical circle, just in front of her, and about two feet in diameter. January is located at the top of the circle, February is at the left of January, and the other months are distributed at about equal intervals around the circumference of the circle. The months run counter-clockwise. Whenever any month is mentioned, she always sees the month located in its proper place in the figure.

Similarly, Miss Bertha S. has a mental calendar consisting of the months arranged on a circle. But in this case, the circle is horizontal, and the months run clockwise, with January nearest to her. The circle is definitely located with reference to the person, being directly in front of her.

Miss Mira F. has a mental calendar, which is also a circle, about as large as the "top of a bushel basket." It is vertical, perpendicular to the line of sight, but is located toward the right hand, instead of being directly in front.

Another variation of the position of the circular calendar is found in the one described by Miss Maude R., who describes the months as located on a circle, with January nearest to her, and the months running counter clockwise. Instead of being horizontal, the circle is tilted downward toward the left.

In all the cases referred to above, the circle has been rather small, easily managed, but the size varies considerably. Thus Miss Florence J. has a calendar that is a very large circle, so large that it would take her a year to walk around it. She is located at the center of the circle, and the months run counter clockwise. Another young woman describes the circle of her calendar as being large enough to reach all around the city in which she is living.

The calendar of Miss Marjorie S. presents an interesting variation in circular calendars. Miss S.'s calendar is a horizontal circle, just in front of her, with the months running clockwise, and about evenly distributed around its circumference. The noticeable thing about this calendar, however, is the fact that each month is represented by a group of six-pointed stars. Every month except February consists of a group of five such stars, while February has only four. Miss S. describes the circle as about two feet in diameter.

But the calendar is not always conceived as a circle. That seems to be the most common form, and we may associate it in some way with many pictures in almanacs, in which the months are so arranged. But such an explanation will not account for the peculiar shapes and variations that many mental calendars assume. Thus Miss Marjorie V. has a mental calendar that assumes the general shape of a square, with the right hand upper corner cut off. The months run clockwise, with January near the upper right hand corner.

Miss Florence S. has a calendar consisting of an elongated oval, with the longest axis of the oval pointing away from her. January is near the middle of the right side, and the months run counter clockwise.

In several cases the calendar is a semicircle. Thus Miss Ethel G. describes her calendar as consisting of a semicircle with the diameter horizontal and extending from left to right. The circumference is convex upward, and January is at the left. Similarly, Miss Etta G. has a calendar consisting of a semicircle in which the diameter projects straight out in front of her, and January is farthest from her, with December nearest.

Many times the calendar consists of merely a straight line. Thus Miss Genevra W. experiences the months arranged in a straight line extending away from her toward the right and upward. Mr. Fred F. always sees the months arranged in a straight line extending downward and toward the right, except that July and August occupy the two sides of a sharply acute angle extending toward the right.

Miss Marian B. has a calendar that presents another variation. The months are arranged along a line that is distinctly spiral, with April at the center, and the months very unevenly

DESCRIPTION OF PLATE III.

Fig. 1.—Monthly Calendar of Mina W.

Fig. 2.—Monthly Calendar of Ethel G.

Fig. 3.—Monthly Calendar of Marjorie S.

Fig. 4.—Weekly Calendar of Marjorie S. This represents the star of which the groups of stars in Fig. 4 are composed.

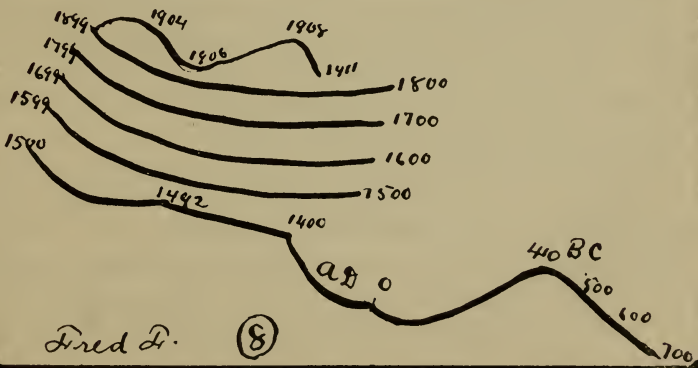
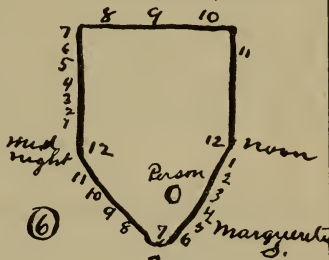
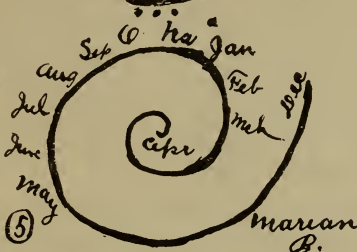
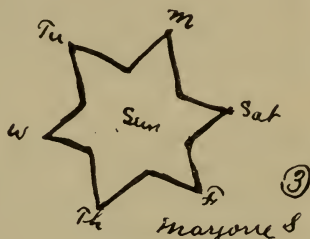
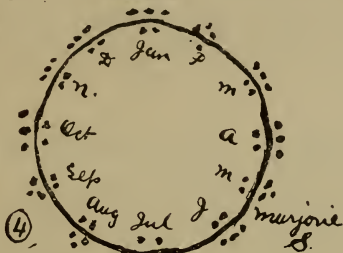
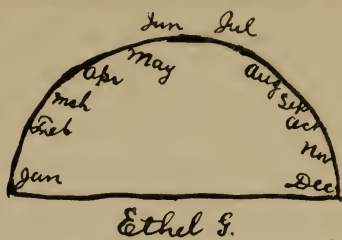
Fig. 5.—Monthly Calendar of Marian B.

Fig. 6.—Hourly Calendar of Marguerite S.

Fig. 7.—Weekly Calendar of Hetta F.

Fig. 8.—Chronological Figure of Fred F.

Plate III.



distributed along its course. In this figure the line is distinctly seen, and along a large part of its course, no months are located, while the months are not serially arranged. December is at the extremity of the spiral, April is at the center, and January and November are in proximity. It would seem almost as if we might describe the figure as having two branches.

In some cases, even when the general shape of the calendar is a circle, the months are not symmetrically placed. Thus Miss Ida F. has a circular calendar which is vertically placed in front of her, with January at the top and August at the bottom. One side of the circle contains eight of the months and the other half only four.

In nearly every case, there is a definite location for the calendar, whatever its shape may be; but the location of the person with reference to the figure varies greatly. In the cases described above, the person has been located in front of the figure, to one side of it, or in the center, and we may discover another variation. Miss Myrtle H. has a calendar that consists of a circle about on a level with her waist, and the circumference of the circle runs through her body. January is at her right, and the months run counter clockwise.

WEEKLY CALENDARS

In all the cases described above, the calendar has been one for the months. But many persons have similar calendars for the days of the week. Miss Marjorie V. describes her calendar for the week as consisting of a series of four straight lines, joined at obtuse angles with Sunday at the right, and the first horizontal line carrying the days from Sunday to Wednesday. The next line joins the first with a downward slant, and carries the days Thursday and Friday. The third line continues the horizontal direction and bears Saturday, while the fourth line, on which Sunday is located, turns upward.

Miss Leona H. has a calendar that is a horizontal circle with Sunday at the right near herself, while the days run counter clockwise, with Saturday at her left.

Miss Genevra W. has a calendar that is circular, approximately horizontal, and in front of her, but considerably inclined toward the right. The quite unusual thing about this calendar is that the days have each a marked day form. The

days are arranged on the circumference of the circle, but each day consists of a circular part, which is the night, and a hook bent twice at right angles which represents the day. The circular nights are placed toward the outside of the week circle.

This figure illustrates very satisfactorily the definiteness with which the days and the weeks are imaged. Another example will exemplify the same characteristic. Miss Maude R. has a calendar for the week that may best be described by saying that it is a rectangle with the angles rounded, except the upper left hand corner, which is sharp. The figure is vertically placed, and is about as high as her shoulder. Monday is located at the upper left hand corner, and the days run clockwise.

Miss Hetta F. has a calendar for the week that consists of a combination of straight line segments and curves, extending in a generally horizontal direction toward the left. Each day is located on its own segment, and Saturday night and Sunday night have each their own segments, which are vertical. She does not know why Saturday night and Sunday night are differentiated from their corresponding days, when none of the other nights are, but the description of this peculiarity always provokes audible amusement in the class.

This differentiation of nights and days is carried to its natural limit in the calendar of Miss Margaret McG. Her calendar consists of fourteen straight lines connected at their extremities so as to form a series of V-shaped angles, the angles being at the top and bottom. The nights are located at the top in a straight horizontal position, and the mornings are located at the bottom, with a straight line connecting each night with its corresponding antecedent and subsequent morning. These mornings are in a straight horizontal position, except Friday, Saturday, and Sunday. The lines connecting the nights and mornings of these days are longer than the others, and Miss McG. suggests that it may be associated with the fact that Saturday and Sunday are school holidays.

Miss Tidy P. describes a weekly calendar that contains one element which is not found in any of the others, and which might probably make its description be placed more appropriately with another series of phenomena. Her calendar consists of a series of seven circles of solid color. The first one at

the left is Monday. It is a solid circle of greenish blue. The next circle toward the right is Tuesday, which is yellow. Wednesday is red with a black spot in the center. Thursday is yellow. Friday is green, Saturday is white, Sunday is purple or black. Miss P. supposed that everybody saw the days of the week in just this shape, and with identical colors, and her first knowledge that others did not have the same experience came from the investigation originating in the class.

HOURLY CALENDAR

In a few cases, there has been discovered a calendar for the hours of the day. Miss Marjorie V., who images nearly everything in visual experiences, describes a daily calendar. This consists of a series of seven straight lines joined together at angles to constitute a broken line extending toward the right and upward. The first segment is horizontal and carries the hours from 1 in the morning to 10. The next segment carries the hours from 10 to 12 and extends to the right and upward about 45 degrees. Each succeeding segment is alternately horizontal and upward about 45 degrees, bearing the time of about two hours.

Miss Marguerite S. has a calendar for the hours of the day. It is an irregular figure, placed horizontally and she finds herself standing within its outlines. The calendar begins at twelve o'clock, noon, passing toward the right, clockwise, and she feels herself to be standing near the six o'clock position. The numbers on it are of different degrees of brightness. The hours of the day are bright, and the hours of the night are dark.

Very similar to these mental calendars is a chronological calendar, which may be illustrated by a very complete one reported by Mr. Fred F. Mr. F. remembers dates in history very satisfactorily by the aid of a historical calendar. The dates from 700 B. C. to 410 are located on a line beginning at the right and extending upward and toward the left. From 410 B. C. to 0 the dates are located on a line that makes a curve downward and toward the left. From 0 to 1400 A. D. the dates are located on a curve extending toward the left and upward, concave above. From 1400 to 1492 the dates are on a straight line that continues the general direction of the figure.

Then another curve, concave above, carries the dates from 1492 to 1500. The four hundred years from 1500 to 1900 are carried on four parallel curves, one above another, and corresponding to the left hand side of the figure. From 1900 to 1911, the numbers are borne on a compound curve composed of two elements, 1904 and 1908 being at the upper nodes of the curve, and 1906 and 1911 being at the lower nodes.

There seems to be no possibility of accounting for the forms that these mental calendars assume, nor indeed for the fact that some persons experience them while others do not. The only thing that can be gained from their study is that some persons have these psychological experiences and find them to be very helpful in some of their mental processes. While it is impossible to reduce the various kinds to systems, their great variety will show us that we must not expect to teach children by imposing upon them plans and methods of teaching that rest upon the assumption that all children possess them, can develop them, or may employ any particular kind. Here as everywhere, individual peculiarities of children must be taken into account, if we are to deal with them wisely, and the more we can learn of these individual peculiarities, the less we shall be inclined to treat children as beings cast into one common mold.

The number of persons who experience mental calendars is in the aggregate very great, but the proportion of those that have been ascertained is comparatively small. The above conclusions have been derived from a study of about fifty cases, collected from about eight hundred students. This would seem to imply that mental calendars can scarcely be anticipated from more than six per cent of the people. It is probable that this proportion is too small, and that a more careful search would disclose a greater number.

ALPHABET FORMS

A phenomenon very similar to that of number forms is found in what may by analogy be called alphabet forms. Nearly everybody learns the alphabet sometime, and some persons have particular ways of holding it in mind. Thus Miss Hetta F. has a very definite form for the letters of the alphabet. The letters are always imaged or seen in a very complex

DESCRIPTION OF PLATE IV.

Fig. 1.—Weekly Calendar of Genevra W. Note the shape of the days.

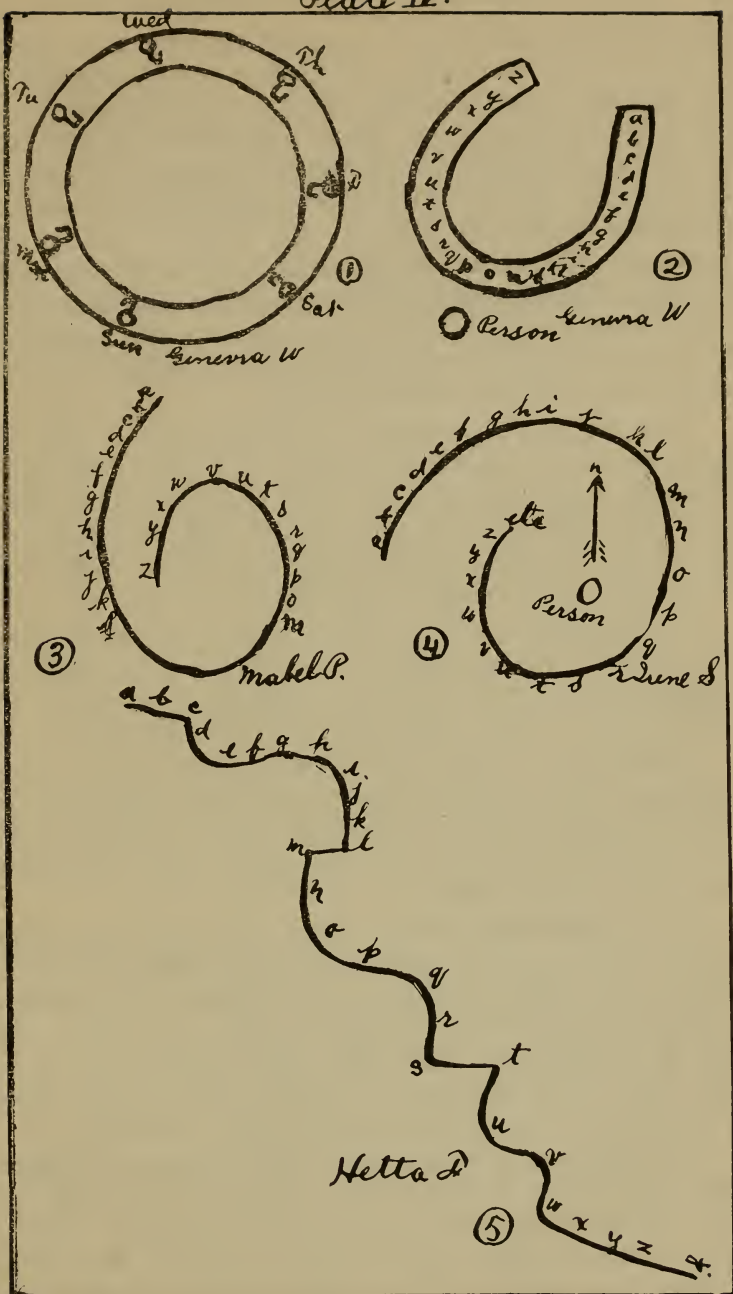
Fig. 2.—Alphabet form of Genevra W.

Fig. 3.—Alphabet form of Mabel P.

Fig. 4.—Alphabet form of Irene S.

Fig. 5.—Alphabet form of Hetta F.

Plate IV.



line, consisting of a series of compound curves running downward and toward the right. The figure is copied from a drawing that Miss F. made herself, and is a very definite and positive statement of the form. Miss F. describes the alphabet as being experienced with a great deal of vividness, and says that she invariably sees any letter that is mentioned as located in this line.

Mr. Fred F. also has a very definite manner of imaging the alphabet. His alphabet form consists of a combination of a series of curves and broken lines joined at various angles, but the general direction being approximately horizontal, and extending from the left toward the right.

Miss Marjorie V. describes an alphabet form in which the letters are seen arranged along a series of straight lines joined at various angles, beginning at the left and extending toward the right. The letters are not equally distributed along the lines, but in some sections are much more closely crowded together than in other parts of the form.

Miss Mabel P. sees the letters of the alphabet arranged along a line which in its shape, reminds one of a greatly enlarged figure 6. The bottom part of the 6 has no letters, and l is at the left of this vacant space with m at the right.

Miss Irene S. images the letters in the form of a spiral, beginning at her left and running around her clockwise. She stands near the center of the spiral, and z is nearest to her on her left. The position that she assumes with reference to the spiral is facing north.

The alphabet form of Miss Genevra W. differs from those described above, and is equally definite and exact. Miss W.'s alphabet form takes the shape of a horseshoe. The horseshoe is almost in front of her and about as high as her waist. The bars of the shoe are turned away from her with "a" at the right hand end of the bar; n, o, p, are nearest to her, and z is at the left hand end of the bar not very far from a.

The testimony of every person who describes an alphabet form asserts the definiteness and clearness with which the letters are seen, and the invariableness of the figure. None of them is able to suggest when nor how the figure assumed its present form, but all of them testify to the advantage that

comes from using the figure in remembering things that are associated with the letters.

In several of the examples adduced above, it will be seen that the general direction of the form is from the left toward the right. As this is the direction in which we read, we may be inclined to suppose that it is this fact which has determined the general direction that the alphabet lines take. Beyond this, we have no way of suggesting any reason for the shape of the form, nor why some persons have alphabet forms while others do not.

CHAPTER VII

CHROMOESTHESIA

The present chapter treats of a phenomenon of individual experience which is known by the name of chromoesthesia, or colored hearing. It is a phenomenon which was first brought conspicuously to the notice by Psychologists by Francis Galton, and more particularly popularized in this country by the personal experiences of President David Starr Jordan, who published his personal account in the *Popular Science Monthly* for July, 1891. The phenomena are well known to psychologists, although a knowledge of it has penetrated into the common knowledge of the people so little that we sometimes observe in newspapers an account of a single case, heralded as an extraordinary manifestation of supernatural phenomena, baffling to science, and unexplainable by any hypothesis that scientific men are willing to recognize.

We may best understand the phenomena by an examination of several particular instances: The case of Miss Dorothy D. is very typical, and involves nearly all the characteristics that are to be found in a majority of cases. Miss D. says that she experiences color sensations when she hears the names of any letters of the alphabet. When she reads, or hears, the letter a, she experiences the same sensation that she would experience if she were looking at a pink object. The letter b arouses in her a sensation of brown; c is white; d is black; e is blue; f is light gray; g is green; h is pink, although of a different shade from a; i has no color; j is gray, but of a different shade from f; k is lavender; l is yellow; m is brown; n is tan; o is white; p is a kind of vivid pink; q is brown; r is bright pink; s is grayish white; t is dark gray; u is greenish gray; v is lavender; z is brown. Some names appear to furnish a color sensation, but in nearly every case, the name seems to take its color from the initial letter. Her own name, Dorothy, is black and white, which constitutes the color sensations aroused by the two letters that are conspicuous in it; d, the black, and o, the white.

Miss D. furnishes also another bit of testimony which is significant in the theory by which these color sensations can be explained. She says that sometimes it is the letter that

furnishes the sensation of color, and sometimes it is the background. R is a white letter on a background of pink. A is a pink letter without any background.

That the letters of the alphabet should be colored is a very common experience. Or, if we wish to speak accurately, that the sound of the letters should arouse color sensations, is very common. Miss Blanche C has a very pronounced case of colored hearing. The sound of the letter a always arouses in her the sensation of white; b is blue; d is dark brown; g is gray; i is black; l is black; m is black; o is yellow; p is pink; r is red; s is red; t is brown; u is blue; v is pink; w is olive; x is red; y is yellow. Other letters have no color.

It is significant in this case that so many of the letters are the initials of the words that represent the color sensations aroused by the letters themselves. Thus b, d, g, p, r, y, are all of them the initials of the words used in describing the sensations of color, while u is the most conspicuous sound in the word blue, which is its concomitant color sensation.

Miss C. also experiences color sensations when she hears the names of the months. March is red; August is white; September is yellow; the other months are not colored. Sunday is yellow; Monday is black. Some names are colored, although not nearly all. Her own name, Blanche, is blue. This is rather unexpected, for we find in a good many cases that the name which is significant of a color, is likely to be experienced in that color. In a majority of cases of colored hearing, the name Blanche is likely to arouse the sensation white. Similarly, in a majority of cases, when the days of the week arouse the sensations of color, Monday is likely to be colored blue.

Another very exceptional statement of Miss C, which is important because of its exceptional character, is the fact that in her experience, the less familiar names are likely to be colored, while the more familiar are likely not to have any color. This experience has occurred ever since her earliest recollections.

To show the definiteness of the color sensation, and its lack of dependence upon teaching, we may examine the report of Miss Leona H. who has a very pronounced experience with colored hearing. Miss H. reports that the sounds of nearly all the letters arouse in her the sensations of color. Thus a is red;

b is light green; c is cement color; d is yellowish brown; e is a pinkish yellow; f is a peculiar cool color, something like the color of the blackboard, but bluer, although not quite blue. This is a color for which she has no name, although it is very distinct, and appears in connection with several auditory symbols. It appears on inquiry, that she once had a German dictionary which was exactly the color described under f.

G is dark brown; h is yellowish brown; i is white with black lines around it; j apparently has no color; k is like f; l is white; m is a dark blue; n is light brown; o is white; p is green; q is a kind of funny yellow; r is blue; s is slate color; t is yellow; u is black; v is green; w is dark brown; x has no color; y is yellow; z has no color.

An examination of the colors aroused by the different letters in the three cases described above, will show that there is no uniformity in the color sensations aroused by the same letter. Thus in the three cases, a is white, pink, and red; b is light green, brown, and blue. So it is perfectly evident that the color sensation connected with hearing is not a natural or systematic affair, but a wholly individual acquisition, arising from some experience in the life of the individual herself.

In Miss H's case, nearly all words are colored, and it seems that the initial letter gives color to the whole word, although this rule is not invariable. The names of the months are all colored. January is that blackboard color like f and k; February is bluish green; March is like f and k; April is red; May is like f and k; June is slate color; August is red; September is a dirty white; October is pure white; November is brown; December is yellow.

The days of the week are all colored. Sunday is white; Monday is light blue; Tuesday is yellow; Wednesday is brown; Thursday is yellow; Friday is red; Saturday is slate color.

Nearly all names are colored. Thus Annie is red; Harold is reddish brown; Florence is like f and k; Bernice is green; Charlotte is light blue; Edith is light yellow; Irene is white with black lines around it; Mae is like f and k; Blanche is green. Every name is colored, and the examples above are merely the colors applied to the names on my class list taken down in order.

Names of all states and countries are colored. There is in

some things more or less of a variation. While nearly every word has a constant color, some words will appear at times in one color, and again in another.

Miss H. testifies that this color phenomenon has been an experience with her ever since she can remember anything. When a child, she had a set of colored blocks of various colors, and she believes that the reason that i is white with black lines around it is because the letter i on her set of blocks was a white block with a black letter.

The above cases may be called the typical cases. They represent a degree of color sensation with almost every letter and word. All variations of colored hearing may be found between these elaborate experiences and that of the person who has no color sensation at all when hearing words. Thus Miss Mary P. says that the sound of the letter O always arouses in her the sensation of yellow. No other letter and no other word has any such effect. So Miss G. has a single experience. The name Mabel always appears purple to her, and no other name or sound has any color association. With Miss Faye P. the letter O always arouses the sensation of black, and the month January is always white. No other words have any corresponding effect.

Miss Marjorie W. experiences color sensations upon hearing four letters; r is always red; o is yellow; x is black, and f is blue.

It is seldom that we can discover any fact that would indicate anything about the time of the beginning of these experiences, but the following are two very instructive examples. Miss Ida P. says that she formerly experienced a sensation of color when she heard words, but that she no longer does so. She has forgotten nearly all the colors that pertained to the different words, but remembers that all the letters of the alphabet were colored, and that e was yellow. She has forgotten what were the colors of the other letters. All names appeared to her in color. She states that there was no shape to the names of the letters, but when she heard them she experienced a vivid sensation of color. She knows that when she was ten years old, she had these experiences, and thinks that they persisted for two or three years afterward.

Miss P. had a sister who also experienced color sensations

when she heard letters and words, and the two girls would frequently play games with the colors of words. They would ask each other the colors of particular names and words, and she remembers that they did not agree upon the colors they experienced when the different letters and words were heard.

We may contrast the above account with the following: Miss Ethelyn W. experiences the sensation of red whenever she hears the letter a. Any word that contains a is red, although it sometimes is the case, that while the a in the word is red, the rest of the word is green. S is white; r is red; y is yellow; and o is white. Words containing these letters are colored, but no other words.

The rest of the statement of Miss W is quite unusual. She says that these color sensations began to be experienced about the time that she was fourteen years old. She has had, therefore, experiences with the perception of these letters when they were not colored, as well as after they became so. Her case is a direct contrast with that of Miss P. who has changed from a condition where she perceives the letters as colored to one in which she does not. These two conflicting cases render any possible explanation of the phenomena very difficult.

When two letters of different colors appear in the word, the influence of the color of the two upon the color of the word is noticeable in many cases. In the example mentioned above, sometimes a part of the word is colored green in consequence of its complementary relation to the color of the dominant letter in the word, a, which is red. But we have clear testimony to another effect in the following example:

Miss Alta M. manifests the phenomena of colored hearing in a high degree. Nearly all of the letters of the alphabet are colored. A is white or yellow, sometimes one color and sometimes the other; b is red; c has no color; e is red; f is brown; g is green; h is gray; i is light, either white or yellow; j is brown; k is like j. Practically every letter gives its own sensation of color.

Words take their color from the color of the letters. The initial letter seems to have the greater influence upon the color of the word. The word Earl is of a reddish, or pinkish color, seeming to have its color determined by the combined effect of the first two letters. The white of the a seems to modify the

red of the e. The letters r and l seem to have no effect upon the color of the word.

The names of the months are nearly all colored. January is brown; September is golden yellow; March is purple. February has no color; April is light, and May is reddish; June is gray, the u in the word seeming to give color to the word. July is grayish brown, the j in the word seeming to modify the effect of the u.

Every day in the week has its own color. Sunday is yellow. Practically every name is colored. Agnes is white; Bertha is purple; Nola is brown; Loretta is bluish black.

A very large proportion of the persons who have related their experiences are surprised to find that other persons do not have the same experience. They have expressed surprise when informed that other persons do not hear the same things in color. One young man is pleased with names of one color, and not with names of another color, and his preference for persons is quite largely determined by the color of their names. Another person, a young lady, expressed wonder about how persons who had no color sensations from names could remember who persons were, or how they could distinguish their names. All of these suggestions go to show the individual characteristic of the experience, as well as the extreme importance of it to the individual. They also show how necessary it is for parents and teachers to have a knowledge that such experiences occur in the children under their care.

Two possible explanations of this phenomenon of colored hearing have been offered. We know that the brain is composed of a large number of separate cells, or brain units called neurons. We know also that no mental process of any kind is ever experienced unless a nervous impulse passes through some combination of neurons. This nervous impulse is some kind of a molecular change in the substance of the neurons, and it appears that the essential part of the nervous impulse is the transmission from one neuron to another.

Also, we know that the different combinations of neurons are not all alike. We know that when a nervous impulse passes through one combination of neurons, it may accompany one kind of a mental process, and when it passes through another combination of neurons, a different mental process is

experienced. When we experience a sensation of sound, a nervous impulse passes through a certain combination of neurons, and when we experience a sensation of color, the impulse traverses a different combination.

The first explanation of colored hearing rests upon the supposition that in some persons, the separation and differentiation of color neurons from the hearing neurons has not been complete, but that the two are so combined that the same impulse traverses both, as a result of this lack of differentiation. There seems to be very little ground for making this supposition, and it is incapable of explaining some of the cases adduced above.

The other hypothesis rests upon a physiological law known as the law of the attraction of the impulse. That law may be stated as follows: When two impulses are established in the brain at the same time, they tend to run together and to constitute a single impulse.

Also another physiological law is involved in the explanation, which is called the law of neural habit. This law may be stated by saying that when a nervous impulse traverses a combination of neurons, it modifies the combination, or brain center, so as to diminish the resistance, and to render the pathway more easy of access to the impulse.

Now we may suppose that a child has experienced the sound sensation of the letter, or the word, or the name, and at the same time has experienced the color sensation. These two impulses combine, and traverse the connection between the two brain centers. Suppose the letter O to be printed in black. The sound of the O, and the color black, are experienced at the same time. The two impulses, started in two different end organs and traversing two different sensation centers, combine, and run together, marking out a pathway between the two centers. Subsequently, an impulse started by the sound center will traverse the center corresponding to the sound O, and then, finding the resistance slight, will pass over into the color center for the sensation of black. Similarly, if a child becomes acquainted with a girl whose name she hears is Jane, who wears a pink dress, ever afterward, the impulse that traverses the brain center that was first traversed when she heard the name Jane, is likely to flow over into the pink

center, when the name Jane is heard and an impulse started in the Jane center.

This hypothesis will explain practically every case described above. It is so simple that it may need more or less modification to meet all cases, for the phenomena are much more complex than would appear from the explanation given. However, this answers very satisfactorily for a working hypothesis.

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CHAPTER VIII

SYNESTHESIA.

Chromoesthesia, or colored audition, or colored hearing, is a special example of a general phenomenon. Chromoesthesia is an example of the association of a hearing sensation with a color sensation. But almost any two kinds of sensations may be associated, so that when one is experienced, the other will be aroused. The name for this entire class of phenomena is synesthesia.

Color and taste are very commonly associated. Thus Miss Lillie C. always experiences the sensation of green whenever she tastes anything sour. Also, when she hears the name of anything that is sweet, she experiences a reddish sensation of color. In this case it appears that the green color is associated with the taste, while the reddish color is associated with the hearing, although the thing heard must be known as sweet.

Miss Emily B. experiences a sensation of taste whenever she hears the names of some of the months. Thus September has a slightly sweet taste; March is bitter.

Mr. J. J. J. experiences a very clear and decided sweet sensation whenever he hears the name April.

Miss Olga M. experiences a rather vivid sensation of bright color, not quite red, whenever she tastes anything sour. The taste of anything sweet arouses a distinct sensation of blue. Bitter is a brightly tinted red. In this case, the color sensation is aroused by the taste, and not by hearing of the word denoting the taste.

Another example illustrating the same thing is that of Miss Teresa K. who testifies that she experiences a positive sensation of green whenever she tastes anything that is sour. She asserts that there can be no question of the fact, because of its vividness.

But other sensations than those of color and taste may be so associated that an experience with one will arouse the other. Miss Dessie I. reports that she experiences a distinct sensation of warmth whenever she hears the letter r. The sensation is quite noticeable, and she feels very confident that there is no chance for her to be mistaken in the fact.

Besides the simple sensations of sound and color, taste and

color, there are many other kinds of sensations that become associated so that when one is experienced, it will call up the other. As would be anticipated, these associations are of the most diverse character. Thus we may experience the sensation of brightness, or light and dark, as distinguished from color. Miss Edna S. experiences a decided sensation of black whenever she hears slow music. To her, slow music is black. She seems to have no other associations of different sensations.

Miss Grace T., however, reports that lively music is always light, while slow and loud music is dark. In very much the same manner, Miss Tacy A. always hears slow strains as blue. They are never pink, while classical music is always pink. She supposed, until I made inquiries of her, that everybody heard music in that way. Also, Miss Marie McC. experiences sensations of brightness, not color, in connection with names. Thus Edith is always dark; Madge is light; Nora is dark.

Of a similar nature, although differing in considerable degree, is the experience of Mr. Floyd E. Whenever he hears the letter R, he always experiences the sensations of a chord in music. Names of persons that contain the letter R induce in him the same sensation, and he decidedly prefers such names. The experience may be described by saying that the letter R induces in him the sensation of the chord of music, or that it gives him the same emotional experience that the strain of music would give.

More complex, and less easy to understand, or to explain, are some other synesthetic experiences, in which the materials associated are more complex than the sensations previously described. Miss Mira M. distinguishes names by their form. She illustrates by the similar names Gertie and Gertrude. The two names are recognized under the form of two lines, nearly parallel. Gertrude is experienced as a line with a series of waves. Gertie is a similar line, extending in almost the same direction, but the waves are shorter and of greater amplitude.

Miss Frances H. always recognizes the long letters like f and b as tall persons. A somewhat similar association is experienced in the case of numbers. Especially is this true with 6 and 8. Whenever 6 is subtracted from 8, her conception of the process is that the numbers are engaged in a conspiracy, of which 8 is the victim.

Miss Clare O. also associates numbers with various human characteristics. 2 always fights with 3. Among the other numbers, there is no definite dueling, but all of them seem to engage in a general melee. However, each number has its own characteristic qualities. Thus 3 is timid; 5 is a rocking chair; 2 is impertinent. This association may be described by saying that the same idea, or the same feeling, is aroused by the number that is aroused by the quality which the adjective expresses.

A somewhat similar association is that which is experienced by Miss Geneva S. with the letters of the alphabet. Each letter has its own personal characteristics. This is especially noticeable when the letters constitute the initials of given names. An initial on the wrong person is very annoying to her. C is dainty and "Frenchy." D is stubborn and phlegmatic. H is elusive and ephemeral. L is smooth and deceitful; M is soothing and maternal. O is comical and "giggly." Q is eccentric.

Miss Sadie M. experiences a different kind of association with numbers. Every number up to fifteen is associated with color, but is experienced in a different way from most of the examples that have been given with numbers and letters. Instead of visualizing the number as a digit with color, Miss M. experiences the number as a series of dots of red and blue. The red dots always precede the blue, and the sum of the dots is the number expressed by the digit. Thus 4 brings about an experience of two red dots and two blue dots. The figure 7 represents four red and three blue.

The example of Miss M. is very similar to that of Miss Edith W. whose experience might be grouped with number forms, rather than with synesthetic experiences. Each number appears to Miss W. as a series of dots, dark in appearance, and she must see the series of dots before the number idea occurs. Thus 7 consists of a series of dots, three in one row, three in a row just below the first, and one below the two rows of six. Eight appears as eight dots in two rows. Sixteen is represented by two series of eight dots each, one series above the other.

Miss W. believes that this method of visualizing numbers is decidedly disadvantageous to her. She finds it difficult to

work with numbers, and she wishes that she had some other way of thinking of them.

The suggestion is at least reasonable that this method of imaging numbers had its origin in the teaching of some over-enthusiastic teacher, in her desire to make the work concrete, and teaching numbers according to the ideas of the old Grube method, established an injurious association which it is impossible to get rid of.

So also, it may be that Miss Sadie M. was taught the early ideas of number by a teacher who employed colored crayon to make the marks which were the concrete symbols of numbers from which the child derived her ideas.

Of a somewhat different class of associations is the one described by Miss Mary S. who testifies that whenever there is a winter storm and the wind shrieks and howls outside, she experiences a feeling of being in a castle hall, with a wide fireplace and a long table, the furniture quite rude, and the castle walls very high. Every time the experience occurs, it is the same castle and the scene is identical in every respect.

It will be seen from the above examples how varied and how different are the mental experiences of children. It is with these different materials that a teacher has to work, and to elaborate out of them the same general laws for teaching. In learning to read, and in learning arithmetic, the children are supposed to be learning the same things; but the materials out of which they construct the system of thought that is embodied in the subject are as varied as the children themselves, and this merely emphasizes the difficulty that the teacher encounters. A knowledge of the various mental processes employed in thinking the elementary associations will enable the teacher sometimes to explain her failures, that otherwise would seem unaccountable.

The fact of early association will in every case explain the apparent mystery involved in these synesthetic experiences. They may be designated as queer, erratic, morbid, mysterious, abnormal; and a mystical, supernatural, spiritualistic explanation be suggested for them. But in every case, where we are able to penetrate sufficiently into the early experiences of the children, we shall find a perfectly natural and clear explanation for the phenomena. They are mysterious only because they

are individual. The mystery appears only because children are not alike.

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CHAPTER IX

ORIGINAL LANGUAGES OF CHILDREN

Children do not learn to talk. They begin to talk as the result of the development of an instinct. By this statement we mean that if two or more children were brought up in such a manner that they might never have heard a word of spoken language, nevertheless, they would begin to communicate with each other by means of articulate speech.

The child, and human beings in general, use articulate speech as a means of communication, because they have a speech center in the brain. This speech center is in nearly all cases, on the left side of the brain, just above the fissure of Sylvius. An injury to the brain in just this spot will invariably produce an inability to speak; while a similar injury in the corresponding spot on the right side of the brain will not diminish the speaking ability.

This portion of the brain is called the speech center, because, whenever a person speaks, a nervous impulse is traversing some combination of cells in this portion. It is true, that other portions of the brain are connected with this part, and an injury to those other portions will modify the ability to speak in various ways; but an injury to this portion will completely destroy the ability to speak.

The speech center becomes organized as the result of a tendency to grow and organize, not as the result of experience. Without any speech, the brain center would become organized so that impulses would be able to traverse its cell combinations.

Speech is not necessarily a measure of intelligence. A dog or a horse cannot speak, and never by any possibility can become able to speak, because they have no speech center. Some dogs have more intelligence than some men, but the men can speak and the dogs cannot.

A child does not learn to talk, but he does learn a language. He has an instinct to speak, and as soon as the instinct develops, he will begin to talk. But he has no instinct to speak any particular language. There is no English language instinct, nor French language instinct, nor an instinct for any other language. The fact that we confuse the instinct of speech with the learning of the language is the occasion for

the difficulty in understanding the processes of a child's beginning to talk.

If children were brought up where they heard no spoken language, they would develop a language of their own. In our present complex society, where children hear one language every day of their lives, there is little opportunity for any child to develop a language of his own. Especially is this true when, if a language should be developed by a child, there is immediately an effort on the part of all concerned to stamp out his language, and to cause him to speak the language used by those around him. Occasionally, however, conditions are such that children do develop a language of their own, and the study of a few cases of such languages will contribute much to our knowledge of children.

In the following pages, twenty-one different cases of languages invented by children have been considered. Unfortunately, it has not been possible for the writer to study these cases at first hand, but reports have been examined that were made by persons who knew the circumstances, and were in position to know the children themselves. Most of those making them were little skilled in the observation of such phenomena. The most that can be learned from them is the fact that there are such languages invented by children, and the characteristics of the children who invent the languages, together with the situations under which such languages develop.

An examination of the reports made of several cases will disclose the chief characteristics of the development of such languages. The first case is one which was reported by Miss Ivor S.

Miss S. reports that she lived on the adjoining farm to the one on which the children lived, whose language constitutes the subject of this report. She went to the school with the children, and heard the children talk with each other. The matter was one of serious concern to the parents and to the teacher, but the real significance of the phenomena did not appear to either.

The name of the family was R. and they lived on a farm near R. C., Ohio. There were six children in the family, the oldest of whom did not manifest the linguistic peculiarity of the three children next in age. The next three children were;

not widely different in age, and they were the ones in whom the new language appeared. The youngest two children did not manifest the linguistic character.

The parents were rather taciturn persons, talked but little at home, and both went out to work, either in the fields of their own farm, or as hired help to the neighbors. The children were left very much to themselves at home, and visiting with neighbor children was not only difficult, but was forbidden and discouraged by the parents. All of these circumstances were favorable to the development of an original language.

The children, numbers 2, 3, and 4, talked freely with each other, and could understand readily what each other said. They never talked with the parents, nor with other children, and these could not understand what they said when they were talking with each other. It was supposed by the parents that the children had an unfortunate defect in speech, but the real explanation did not occur to them. Finally, when the oldest of the three was seven or eight years old, they all started to school. Their inability to speak the language that the teacher and the other children employed was a source of great annoyance to the teacher. Miss S, believes that at this time neither one of the children knew twenty-five words of English.

The children talked freely with each other, and could understand what each other said, but no one else could understand them, nor could they understand the speech of other persons. As soon as it was recognized that they were unable to speak the language of the school, efforts were made to teach it to them. They learned it rapidly, and soon forgot their original language.

Here we have all the conditions favorable to the development of an original language; three children, neither of whom knew any language, isolated, seldom hearing any speech. Then when they developed a language that no one else could understand they were thought of as having a defect in speech.

A quite similar case is one reported by Miss Lulu M. The C. family, living on a farm near C. C., Michigan, consists of a father and mother, and eight children. Mr. and Mrs. C. are very hard working people with a common school education. Their children were left alone much of the time, and invented a language of their own, which they used for communicating

with each other. All the children used this language, or did use it until they became old enough to "work out" in other communities. The general impression among the neighbors, when they were little children, was that they were mentally defective. But as soon as the children began to work in other communities, and learned the language of other people, it was found that they were mentally very quick and bright.

In this case, the conditions were favorable for the development of an original language, and for its continuation until its recognition was forced. Persons are generally very slow to recognize an original language. They are likely to explain the language by saying that the children in whom it appears have a defect in speech, or that they are mentally defective. In the two cases above, one explanation prevailed in one case, and the other in the next.

The next case introduces another feature into the situation. The case is reported by Mr. Henry S., who lived in the same neighborhood with the children, and went to school with them. His observations, moreover, are corroborated by reports of the neighbors who have talked with him about the children.

The family was named H. and they still live near S., Michigan. There were five children in the family, the oldest three being girls, and the youngest two being boys. It was with the boys that the new language appeared. The family lived on a large farm, and the boys were left much alone. The older boy seems to have been the one with whom the new language developed, and the younger adopted his method of speaking. The two boys talked freely with each other, and could readily understand what each other said, but other persons could not understand them. When they started to school, the other pupils could not understand what they said, and they had to begin to learn the English language, as they did not know how to speak it.

The family and the neighbors did not regard the boys as deficient in intellect, but thought they had a serious impediment in their speech. They recognized a peculiarity in their method of speaking, and commented upon it. The boys are now about twenty-six years old, and still employ some forms of their original language when they talk with each other.

In this case, there are indications of the persistence of

some portions of the language, even though the boys learned to speak the common language of the other people very well.

It is very difficult to discover any of the word forms that are employed in these original languages, and much more so to discover the grammatical constructions that children use. Miss Sarah R. reports the case of two children of her brother, who seem to have had a language of their own. They were two boys, and were two or three years old when they began to use their original language. They conversed fluently with each other in this language, which no one else could understand. By the time they started to school, they could converse with other persons in the common English language, but when they were by themselves, they employed their own language. So far as Miss R. is able to determine, it was principally in the nouns and adjectives that the original language differed from the common language. The construction, and the verbs, so far as she remembers, were similar to the English. She has asked her mother for any words that the boys used, and she has remembered two. *Bebbleboarm*, and *contragooeeye*, were names of toys with which the boys played.

The clearest case of the development of an original language, in which the instinctive character of speech seems conclusively demonstrated, is one reported by Miss Gladys McA. It is the case of two children whose parents live in Detroit. The parents are both deaf and dumb. The father is an architect and the mother is also well educated. There was no spoken language in the home, but the children began to talk by themselves, and had a clearly defined vocabulary, although of a limited number of words. The fact that the children were learning to speak a language of their own, which no one else could understand, was interpreted by their grandmother as being something very bad so she took them to her home and kept them until they had learned to speak English.

This seems as if it were a natural experiment, which furnishes conclusive evidence of the instinctive character of speech. Of course, it is possible to set up the claim that, although the children did not hear any language in their home, they might have heard speech from other persons, and so have learned to speak in that way. But if that had been the origin of their language they would have talked as other persons talk

and not in such a way that no one else could understand them.

It is almost invariably the case that the use of the original language is discouraged by the parents, and the children made to feel that it is something discreditable and to be concealed. This will account for the very slight persistence in these original languages. Occasionally, however, the language persists. Miss Marian H. reports the case of two children in a family named G. who now live about two miles east of P. in Michigan. Miss H. lived in the same neighborhood, and knows the children herself. The two children who possessed the language talked freely with each other, and the parents and the older sister could understand the greater part of what the children said, although other persons could not. There seems to have been no suspicion of mental deficiency in the family, for the older girl was unusually bright. The speech of the younger children was rather encouraged by the parents, who could understand the greater part of it. So far as Miss H. knew at the time of the report, the children still used the language.

An interesting bit of testimony is found in the account of Miss Marjorie S. Miss S. herself began to talk when she was about twelve months old. She was quite sociable, and as a child enjoyed playing with other children. She had a brother about fifteen months younger than herself, who began to talk about the age that other children do, but who employed a language of his own. Miss S. could understand what he said, but other persons could not. She could translate what he said to the other members of the family, although she did not speak the boy's language even to him. The brother liked very much to play with her, but would not play with other children. When he could not get his sister to play with him, he would go off and play by himself.

Miss S. remembers some of the words that the boy used. One of them was *dabo*, meaning skirt. He had a prefix to the word *dabo* for red skirt, and another prefix to indicate black skirt. *Emboon* meant bread, and *yish* meant sister. He showed a decided preference for his own language, even when it became clear that he was able to learn the language of other persons.

One other example is quite instructive as showing in a measure a rather unusual tendency of an original language to

persist, notwithstanding the very strong influences that tend to eliminate it. Miss Hester P. reports the case of a woman living near P., Michigan, who, as a small girl, employed an original language. Later, she learned English, but the original language persisted. She grew up, married, and has taught her original language to her husband, so that they use it now.

The above represent types of the twenty-one cases of original languages that have been reported to me. It seems that the tendency to develop original languages is almost universal in children, but it is too strong a statement to make, that they are very common. When one is inclined to make such an estimate, it would be well for him to try to describe a few. But they are more common than a casual observer is likely to discover. The reason that so few are recognized is not very difficult to understand. Children who employ them are likely to be classed as defective in speech or deficient in intellect. Also, the disposition to speak an original language is a stimulus to the parents and others to teach the children English. So almost every circumstance contributes to the elimination of the language, and there is no circumstance except the original nature, or the instinct of the child, that leads to their development.

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CHAPTER X

DOUBLE PERSONALITY

The phenomenon of double, or alternating, personality has attracted much interest, and has been quite thoroughly investigated by many persons. In its general phenomena, it is quite well understood; but in its relations to the ordinary experiences of normal persons, it is far from having received anything like a satisfactory explanation.

The cases principally reported have been those presenting the extreme types of the experience, and perhaps all of them necessitating an assumption of pathological conditions, so that we are inclined to believe that the experiences are always and inevitably pathological in their nature, belonging to abnormal psychology proper, and having no counterpart nor relation to the normal experiences of a healthy individual.

The best known examples, and the most instructive, have been described in the writings of Professor James, Ribot, Binet, Weir Mitchell, Morton Prince, Sidis, Coriat, and other writers who have investigated the different cases with a great deal of care. To any one who has given the smallest attention to the subject, it will be sufficient merely to mention the names of such cases as Ansel Bourne, Mary Reynolds, Felida X, Lurancy Vennum, with many others that are almost equally well known. These are all of them extreme cases and some of them have been studied with an assumption of a mystical explanation that does not furnish a connection with examples of the less extreme form, and they fail to furnish a connecting link with the ordinary experiences which occur in the life of nearly every person. Instead of referring to these celebrated examples, I should prefer to examine some related cases that have been reported to me by the persons who have had such experiences themselves.

The first case is that of Mrs. Zaida C., who had the experience, and whose report of it is given in her own words. It is written rather appropriately, in the third person, for she says that her knowledge of what occurred in the second state is altogether derived from the information that her mother has given to her. She remembers no single circumstances that occurred in the second state.

"When a little past the age of eleven, the following curious experience happened to the writer. One day in May, she took a nap in the afternoon, which was an unusual thing for her to do. About two hours later, her mother wakened her, and asked her to go and find out why the woman who was expected to come and do some work had failed to do so. The mother said afterward that she noticed that the child appeared indifferent, and went out of the back door instead of the front, as she usually did, but at the time, no thought was given to the slightly unusual circumstance. The child, instead of going four blocks straight east, as she should have done, went in an entirely different direction, going some distance west and south. Passers-by said afterward that she walked in a very listless manner. She passed playmates whom she did not appear to recognize, but to their questioning, she replied that she was going to borrow some carpet tacks of—(giving a name unknown and on an unknown street). She must have wandered some time during which she stopped at a house and rapped on the door, but did not wait for a reply to her knocking. Upon her return home, she said nothing, which was rather unusual for her, but just seated herself and gazed out of the window.

"To her mother's inquiry concerning the message sent by her, she made no reply. When asked where she had been, she said "Nowhere." Then after some investigation, the foregoing facts were discovered. She gave herself a new name, Patty. Her own name is Zaida. She failed to recognize her parents, her playmates, or her surroundings. She seemed rather indifferent to all around her. Up till two months previously, she had been the only child in the family, and when a little baby sister came, she was exceedingly interested and happy. But during this interval, she seemed to care nothing for the little sister, and she could not be interested in her. She was ordinarily very fond of books and school, but for these few days, she did not care to read. (Query: Had she forgotten how to read, or was she unable to read.) nor did she care to go to school, nor to play the usual games with her playmates. Instead, she seemed fond of sewing, a thing she usually looked upon with great dislike.

"A doctor was consulted, but he said wait a few days longer and see if things would not adjust themselves. During this

period of four days, she was quite a different person; quiet, listless, thoughtful, and utterly unconcerned about the things around her.

"Finally, one morning when her mother called her and she awoke, her own merry, inquisitive, active self had returned. She believed that she had been visiting, remembered nothing that had happened in the preceding four days, and expressed great delight at seeing the baby again.

"As clearly as the writer remembers what was told her, this is all that transpired. There has not been any similar recurrence of the experience. About this time, however, covering a period of two or three years, or more, she had peculiar, indefinable sensations, as if she were slipping away. It was a feeling that she never could describe, even to the doctors who were consulted. When these feelings began to appear, she would go to her mother and say, "Mamma, I am feeling that way again. Take hold of my hands and talk loud." In fifteen minutes or so, the feeling would pass away."

In the above account, we may observe the regular features of an extreme case of double personality. First, the oncoming of the experience occurred just as the person was waking from sleep. While this condition is not at all universal, we shall find it represented in several of the standard examples. There was a total absence of the recognition of the things that were known in the first state, and upon the changing back to the first state, a total failure to remember any of the events that occurred in the second state. This condition of amnesia is the most nearly universal characteristic of this condition, and some times is almost the only indication of there having been a change. Third, there was a noticeable change in the habits, disposition, and interests accompanying the change from the first to the second state. Like several other cases, that may be considered classical in their nature, there was no recurrence to the second state besides this one noted, although there were preliminary symptoms indicating its approach.

A very similar case, although less complete and less extreme, is the experience of Miss Genevieve H. Miss H. reports that one morning when she was about eleven years old, she came down to breakfast and remarked to the family that it was an unusually bright day, and she felt extraordinarily good

for Monday. She remarked that on Mondays she usually felt blue. Her sister said that this was not Monday, but Thursday. Genevieve said, "No, it is Monday, because I did not go to school yesterday." Her sister said that she had gone to school. At least, she had left the house at the regular school hour, had come home for dinner, gone away again, and returned for supper. Genevieve says that she had no recollection of either circumstance. She then went to school, and the teacher inquired rather accusingly, why she had not been at school the day before. Genevieve says that she does not know now, and did not know then, why she did it; perhaps the assertion of her sister a short time before, and her willingness to defend herself, but she lied. She told the teacher she had been at school, although she had no recollection of it at all. The teacher condemned her for lying, and kept her after school as a punishment, every night for a week. Miss H. says that to this day, she does not know any single thing that occurred on the day when she was absent from school, and when her family supposed that she was there. She has never found out from any one else what her experiences were. Her family afterward said that they had observed that she was somewhat different in her manner on that day; not so noisy, playful, nor boisterous as was her usual habit.

All that is needed to make this a thoroughly typical example, is to find out the events in the experience of the child on that lost day. If the condition had recurred several times, it would duplicate the features of the most extreme types.

Somewhat similar, and yet more closely approximating the normal condition, less extreme and even more instructive is the case of Miss Marjorie S. Last spring, in June, Miss S. was feeling very bad at supper. She was almost fainting, and asked to be excused from the table. She started for her room, but fainted before she reached it. She was found in a fainting condition by one of the girls in the house, who assisted her to her room.

She was responsible for a meeting of her sorority that evening, and was very much concerned over the event. However, the girl who had found her fainting, was much alarmed over her condition, and assisted her to get into bed. When the time for the meeting of the sorority approached, Miss S. insisted

upon getting up, and went to the meeting. She presided at the meeting, and made a speech upon the matter under consideration. It was observed that she looked intently at one girl in the audience all the time she was speaking.

The next morning, she inquired of her friend how the meeting went off, whether it was held or not, and what was done. She remembered nothing whatever about the meeting, nor of her own experiences while there. She remembered nothing that had occurred after her fainting spell as she was leaving the supper table.

In this case we have the amnesic experience which is the most noticeable feature of all cases of double personality. We do not have in the statement as made, any information about the kind of changed personality in the second condition, and there is not the complete separation of the first state from the second that we find in a strongly marked typical case. The fact that she was able to make a speech upon a matter whose details had been accumulated while in the first state implies that there was not a perfect separation of the two states. It is in consequence of this fact that the example is very instructive. It furnishes a step in the transition from the most complete cases of separation to the normal condition of every day experience.

Another example that is very instructive because of its transition character between the extreme types of cases and the normal condition is that of Mr. Orla G. Mr. G. had learned a piece to speak in his elocution class. He was reciting the piece in the presence of an audience composed principally of the members of his class, when suddenly he was unable to go on. The selection was from Ben Hur, and it was the scene between the Angel and the Shepherd. He had come to the end of the Angel's speech, "A voice of sweetness more than human"—when all suggestions of the scene were suddenly replaced by a flood of ideas totally unrelated to the scene, and which concerned a series of troubles connected with his home affairs, blotting out all associations with the theme of his speech. Promptings by the class, at first of single words, then entire sentences, failed to replace the connections. Promptings could not suggest a single idea connected with the story.

Another member of the class got up and recited the same

selection, but even then he could not understand it. It was a full hour before he was able to get back the train of thought that had been interrupted, or could understand any part of the selection when it was spoken to him. When the selection was read to him in this condition, it was absolutely meaningless. Mr. G. reported the case to me immediately, on the same day that it occurred.

In this case there was only a partial interruption of the personal continuity. However, it is an experience of the same order, and would find its explanation in the same series of conditions that would explain double personality.

In all cases of this kind, we shall recognize without any hesitation, that there is a pathological condition involved. It is impossible, in the present state of our knowledge to offer even a tentative explanation of the things that cause the forgetfulness, and the change of disposition. We can, however, very plausibly and with much justification, make the supposition that there is an interruption of the usual paths of nervous conductivity in the brain, and that the nervous impulses are conducted through the brain centers in new ways, entering upon the brain centers from new synaptic approaches, and involving new and different combinations of brain cells. All this is a much more promising and helpful speculation than those which involve the conception of a "split off consciousness," or the bringing to the surface of an "unconscious," "subconscious" or "subliminal" self.

The words, "unconscious self," "subliminal self," "subjective self," all constitute phrases that are so full of misleading implications that they vitiate any argument into which they enter.

Personality is a word that has been much abused. It is used in two distinct senses. First, it is often used to mean a general characteristic of an individual, which is so indefinite in its character that it cannot be attacked in an argument. A person is said to have a strong personality, while another person has a weak personality. The nearest approximation to a meaning for this expression is a character which will be found to depend upon the clearness or obscurity of ideas. A person who has, as a general rule, clear and vivid ideas, is one of a strong personality. The person whose ideas are generally weak

and obscure, who never knows exactly what he wants nor how to go to work to get it, is a person of weak personality. The vividness of the ideas is the distinguishing feature of a strong personality. The feeling that accompanies the ideas is merely an incident, an inevitable concomitant, not the principal character.

But when we use the word personality, in the phrase alternating personality, or double personality, we mean something different from the above. We mean by personality in this sense, the content of the word I when it is used by any individual. It is the sum of the characters that separate one ego from all other egos.

There are two characters by which one ego may be discriminated from all other egos. The first is that there is a certain kind of sameness existing between the psychical states of one ego, that does not exist between the psychical state of one ego and that of another. This sameness of psychical states may be easily understood by recognizing that there is a certain kind of sameness between the physical elements of the ego at one time, and at another, which does not exist between the physical elements of one ego and those of another. One person uses the same brain cells and centers for different psychical processes while another person uses a different series of brain cells and centers. The same kind of sameness exists between the psychical processes that exists between the physical elements. Or it might be better to say that the same kind of difference exists between the psychical processes of two egos, that exists between the two physical organisms connected with them.

The second difference that discriminates one ego from all others, is that there is a continuity existing between the psychical processes, so that the same designation may be employed for them at widely different times. The continuity is more apparent than real. The psychical processes of two men of twenty-one years old are more nearly alike than are the psychical processes of one of the men at twenty-one, and the same person at the age of three. Yet we assert that the man of twenty-one is the same person that he was at three, and is not the same person as the other man at twenty-one.

The continuity consists in the slowness of the changes, so

that it is easy to follow its progress; and also the same connections that have been once formed between processes both mental and nervous, have been maintained. It is not that the personality has not changed, but that it has changed so slowly that there has not been at any time a serious interruption of the continuity.

The human being in his psychical processes uses certain brain areas and certain groups of brain cells. If it were possible to open up new sense organs, and to employ new and totally different groups of brain cells and centers, a new and different personality would be born. If by pathological conditions, the continuity of nervous processes should be interrupted, new combinations of cells employed, and new nervous pathways marked out, we should have a new series of mental actions to correspond. It is in some such a conception as this that we must seek for a truly scientific explanation of the phenomena of double personality.

Many such experiences as those described above have been observed and recorded. They have attracted attention because of their unlikeness to the usual phenomena of mental life, and have induced study thereby. But if we examine our own experiences, we shall discover that each one of us in his own mental processes experiences phenomena identical with those recorded above, which fail to attract attention because they are very common, much less exaggerated, and less noticeable from their milder intensity. Many of our forgettings, many cases of unconscious activity, many of the changes in moods, and different impressions that the same set of circumstances make upon us, are due to the same kind of causes which bring about the extreme forms of double personality.

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CHAPTER XI

PARAMNESIA

Occasionally a person will find himself in a situation where he has the feeling that every circumstance has been in exactly the same relation to himself on some previous occasion. There is the feeling that everything has happened just as it is now in some past time. It is recognized as having been previously experienced. There is a feeling of familiarity that is almost startling in its convincingness. This experience is called paramnesia. It is this feeling of familiarity, the has-been-experienced-before consciousness. About twelve per cent of all persons have had this experience, although some estimates place it as high as thirty per cent.

It is this feeling that constitutes the chief evidence for the doctrine of reminiscence, which is a doctrine that states that the soul has existed in some place before its induction into the body of a little child, and remembers in a fragmentary way, some of the incidents of its previous existence. This is the idea that is poetically exploited in Wordsworth's *Intimations of Immortality*.

* * * * *

Our birth is but a sleep and a forgetting.
The soul that rises with us, our life's star,
Hath elsewhere had its setting,
And cometh from afar.
Not in entire forgetfulness,
Not in utter nakedness,
But trailing clouds of glory do we come
From God who is our home.

* * * * *

It is this same paramnesia experience that constitutes the psychological basis for the doctrine that all events occur in cycles. In some of the Eastern forms of the doctrine, it is asserted that events happen in exactly the same way and in the identical succession every fifty thousand years. No doubt, too, it is the psychological foundation for the belief in metempsychosis, or the doctrine of the transmigration of souls. The soul in some previous incarnation may have witnessed exactly such a scene, and now, in its present incarnation, has a faint rec-

ollection of that previous experience when he observed it under changed conditions. It seems evident that a mental experience which can furnish corroborative evidence for doctrines of such great influence as these, is deserving of serious consideration.

An examination of the reports of cases of this experience will enable us to discover the essential features. Mr. Arthur M. reports that he has often experienced the phenomena. On one occasion, on a trip into the Rocky Mountains, he discovered a little valley of rather peculiar nature. Suddenly, he appeared to recognize that valley, as having been seen before, down to the most minute detail. He knew that it was impossible for him ever to have seen that valley, or any valley similar to it. Nevertheless, there was exactly the same feeling experienced that there would have been had he been looking at a valley that he had previously seen. He inquired if he might not have dreamed of such a valley. It seemed improbable that he had ever seen a picture that was similar, and the circumstance made a deep impression upon him.

The feeling of familiarity which constitutes the element of recognition, is the essential feature of this experience. In this case, the recognition occurred in surroundings that were wholly unfamiliar. But in quite half of the cases, the feeling is experienced in surroundings with which the person is already thoroughly acquainted.

Miss Zilpha P. reports that just the day before the report was given, while passing down a street that she had passed over hundreds of times, she suddenly experienced the feeling of having been in exactly the same situation in every detail on some previous occasion. The locality was the same, but perhaps never, in any experience, is there a perfectly complete combination of the thousands of details a second time. But in this case it seemed as if every detail had been experienced in just this combination. About half of these experiences occur when the locality is the same with which the person is familiar, while the other half of all experiences reported occur in unfamiliar localities.

Mr. Glenn H. records an example of paramnesia that is very clear and instructive. When he was about seventeen years old, he drove about fifteen or twenty miles with a dog

and gun, for the purpose of hunting rabbits. He carried his lunch with him, and coming to an open place, he sat down to eat it. Suddenly there came to him a feeling of familiarity as if he had been in exactly the same situation before, and every detail of the situation had been perfectly reproduced. It was certain that he had never experienced this situation before, and it was impossible for many reasons, that he could have done so.

The above examples disclose the essential characteristics of the experience. There are some incidental features of the experience that ought to be noticed. It is somewhat common, in paramnesic experiences, for a person to believe that he could have predicted the next event in the series, or the next thing that would be seen around the corner. Thus Mr. Harry H. reports that something more than a year ago he visited for the first time, the town of B. As he was passing down one of the streets of the little town, he experienced the feeling that he must have been in exactly the same conditions in every respect on some previous occasion. So familiar did everything appear to be that he was confident that he could have described the location and the appearances of all the houses around the corner in the next cross street into which they had not yet turned.

It is probable that this feeling of being able to predict what is yet coming is an illusion. Very seldom is it possible to try the experiment, but one report is a perfectly satisfactory account of such an attempt. Miss Blanche T. was in an auto, with her father, coming from the city of T. late one evening, when they got off the direct road, and were for a time, in effect, lost. Suddenly, she experienced a feeling of familiarity, and seemed to have been in exactly the same situation before. She announced that she knew where they were, and could describe the very turns that they must make to get into the proper road for their journey. Her father followed her indications and not a thing turned out as she felt it ought to. She was mistaken in every particular. It seems probable that such will be found to be the case very generally, in paramnesic experiences when a person undertakes to predict what will be the next incident in the situation.

However, it is very probable that some person, who already

has a profound conviction of the truth of the doctrine of reminiscence, will report experiences to the contrary. Miss Muriel G., who is a Christian Scientist, reports that she has a friend, a Mr. A., who is a firm believer in the doctrine of transmigration of souls. He believes that in his just preceding incarnation he was a Frenchman and lived in Paris. He asserted that on his first visit to Paris (in his present incarnation), everything was so very familiar to him that he was certain that he could find his way without difficulty to a particular hotel, in consequence of remembering it from his previous existence. He reported that he did find the hotel, without any directions from other persons, and that the entire route was perfectly familiar to him. An account like this is to be considered reliable to just about the extent that one is able to prove it independently.

It appears from the reports, that younger persons experience the phenomena of paramnesia more frequently than do older persons. As a person becomes older, the almost universal testimony is that the experiences become less frequent.

The number of times the experience occurs is not very great. In the reports of the fifty cases that have been examined for this chapter, many of the persons reporting state that they have experienced the phenomena many times. When pressed to make an estimate of what they mean by many times, the estimates run from once every week to three or four times a year. It seems probable that with persons twenty years old, most of those who experience the phenomena will notice on the average, one experience in a month.

There are some experiences that have been described under the name of paramnesia to which the designation does not properly apply. Not every feeling of familiarity, is a paramnesic experience. The recognition of something as having been seen before, is not necessarily paramnesia. If a thing has been seen before, its recognition, even though it be faint and uncertain, is not properly paramnesia. Some experiments have been made for the purpose of studying paramnesia, that cannot be commended for the purpose. The experiments are such as follows: A person is caused to look at a series of picture cards. These cards are then shuffled with another set of cards that have not been examined. The subject is then caused to look at

the cards, and when a person recognizes one as having been seen before, that feeling of familiarity is described as paramnesia. Such recognitions, and feelings of familiarity with things that have been seen before, is not properly described by the name. The name paramnesia ought to be limited to the feeling of familiarity with that which has never been seen before.

Even in some cases where an object, or more commonly a person, is recognized, and the feeling of familiarity is experienced, the phenomenon is not paramnesia. Miss Mildred A. says that one day she met a girl whom she had never seen before, but whom she felt as if she recognized immediately, and with whom she felt quite well acquainted. The other girl expressed the same kind of feeling toward her, but neither could suggest any opportunity for having met before. It seems probable that there were elements of similarity between the girl and some one else whom Miss A. knew that might have led to the feeling of recognition.

But such an explanation cannot account for the cases of genuine paramnesia. In the case mentioned above, that of Miss Zilpha P., there were any number of points of similarity in the situation, but the feeling at just that particular time when the experience occurred was noticeably different from what it was the day before, or the hour before, when walking down the same street. Neither does it seem possible that the first presentation of the scene with its attending circumstances might have been made in a dream, as Mr. Arthur M. suggests above.

The phenomena of paramnesia have attracted a sufficient amount of attention to serve as a basis for many philosophical theories, as stated in the beginning of this chapter. Each theory is an attempt to explain the phenomena. Also, many theories of a different character have been advanced to serve as an explanation for the mental processes involved.

One such theory is that of Wigan, who supposed that it might be due to the lack of synchronism in the operation of the two hemispheres of the brain. He supposed that the two sides of the brain always worked together, somewhat after the manner of the two eyes; but if for any reason, the two sides should not work quite together, we should have a param-

nesic experience. Such a theory seems altogether impossible, in the light of what we know concerning the localization of function, and the relation of the two hemispheres to each other. Another theory is that paramnesia is due to, first an unconscious perception, followed by a conscious perception which is recognized as being partially familiar, at least. Although the assumption is not necessary, this theory generally assumes the existence of an unconscious mind, or a subliminal self, or some mystical conception of that nature. There is very little evidence in support of such a theory as this.

Paramnesia is an illusion of memory, and it would seem that we can best understand the phenomena by an examination of the nervous processes that accompany an act of memory. Memory is the reinstatement of a previous mental experience with the same conscious elements. It is the reproduction of a mental state and the recognizing it as having been experienced before. Unless the process is both reinstated and recognized, it is not memory. It includes both mental reproduction and mental recognition. The illusory process which we know as paramnesia occurs in the second element, that of mental recognition.

The nervous processes that accompany memory may be described by saying that memory is the concomitant of the transmission of the nervous impulse through the same nervous arc that it passed through before, and the radiation out into the same fringing cells. Mental reproduction is the concomitant of the the transmission of the nervous impulse through the same nervous arc that it passed through before, and mental recognition is the concomitant of the radiation out into the same fringing cells.

Whenever the nervous impulse passes through the same nervous arc that it passed through before, without radiating into the same fringing cells, we experience mental reproduction without mental recognition. Whenever the nervous impulse passes through the same fringing cells without passing through the corresponding nervous arc, we experience mental recognition without mental reproduction. Something of this kind probably occurs when we are trying to recall a name, and are able to recognize it if we hear it. Either of the elements of memory may occur without the other.

Using this conception of the nervous processes accompanying memory, we may establish a hypothesis that will give us a clear understanding of the paramnesic process. In paramnesia, the error, or illusion, is due to the second element, mental recognition. It is not an error in mental reproduction.

Let us suppose that for some reason, the initial impulse passes through the fringing cells without having first traversed the brain center. Then it immediately corrects itself, passes through the brain center, and radiates out into the fringing cells in the usual way. We shall then have the nervous impulse traversing, or entering upon, the fringing cells twice, while there has been only one transmission through the brain center. There will have been two experiences of mental recognition, while there has been only one perception. This would seem to explain all the phenomena that we have noted in the examples described above.

This hypothesis of the transmission through the brain center and radiation out into the fringing cells to accompany a consciousness of the thing perceived, is almost identical with the hypothesis proposed by Elliott Park Frost, in the *Psychological Review*, of May, 1914. What he calls there the alpha-arc, I have called the brain center. When he calls the beta-arc I have called the fringing cells.

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CHAPTER XII

DREAMS

The subject of dreams has been a favorite topic for speculation from the earliest times of which we have any record. Dreams have influenced the thinking and the actions of the whole world, and are still exceedingly influential in determining the philosophy and conduct of nearly every person. Dream books that profess to indicate the significance of dreams, arranged according to the alphabetical order of their subjects, are published, sold and read in great quantities. Religious systems find in dreams the apperceptive basis which renders their promulgation easy.

The theories advanced to account for dreams are almost as many and as varied as the dreams themselves. Many theories of dreams find in the dreams themselves, the evidence of two wholly unlike systems of mental processes, described in the terms of a duality, such as subjective and objective mind; conscious and unconscious mind; and have postulated this duality, to use it as an explanation of the dream phenomena themselves.

The most elaborate and the most ingenious theory of dreams, supported by an almost incredible amount of investigation, is that of Freud. Freud's theory of dreams may best be understood by mentioning briefly a few of its most characteristic features. First, Freud believes that every dream is an unconscious wish. The wish must be unconscious before it can induce a dream. Consequently, the person who experiences the dream, may be wholly unconscious of entertaining the wish. This thesis is worked out by Freud in a most ingenious way, but by the method employed to demonstrate the presence of the wish, it would be possible to prove that the world is a hazel nut.

Second:—The Fruedian theory of dreams postulates the presence of a psychic censor, whose description is that of a mischievous little devil. This psychic censor may also be described as the unconscious mind.

Third:—A very large proportion of dreams are sexual in their origin and character. In order to demonstrate this point, an elaborate system of symbolism is evolved, such as that every

dream that involves going up a hill, or upstairs is sexual.

Fourth:—Nearly every dream involves the reproduction of some experience, under a changed form, that occurred in the very early life of a child. These early experiences may have occurred before the child was a year old, and before there was any possibility of remembering them.

These are merely some of the features of Freud's theory, and they are the features that have been most successfully criticised. Personally, the writer is lost in admiration of the great ingenuity of the theory, but is unable to agree with a single major proposition involved in it.

It seems to be necessary to apply the same principles of interpretation to dreams that we apply to any other natural phenomena. We must not introduce into the explanation any mysterious and mystical element, so long as we have a simpler explanation that is adequate. This principle is known in logic as the law of parsimony, and it will enable us to avoid many absurdities of interpretation. Applying this principle, it seems possible to find a simple and easy way to understand the general phenomena of dreams.

A dream is any mental action in sleep. Any mental action has for its inevitable concomitant the transmission of a nervous impulse through some combination of brain cells which we may call a brain center. When nervous impulses traverse brain centers during sleep, we have the phenomena of dreams.

Sleep is a condition of unconsciousness due to a diminished amount of nervous energy. When the amount of nervous energy liberated decreases below a certain point, then we experience the condition of sleep. Unconsciousness brought about in any other manner cannot be called sleep.

A dream, then, is always accompanied by a smaller amount of nervous energy transmitted through a brain center, than is a waking mental process. In consequence of this fact, the dream is always less vivid than a corresponding waking experience. Also, in consequence of the same fact, a dream is very easily forgotten, and it is not likely to be reported with any high degree of accuracy. This is one of the most noticeable characteristics of dreams. It is almost impossible to reproduce or reinstate a dream experience unless it is rehearsed, reinstated or reported within a few minutes after waking up.

An example of this will be seen in an experience of the writer. One time the writer was coming from Cincinnati to Detroit in a sleeping car. Just about the usual time for waking up in the morning, my suitcase, in the berth with me fell over and struck me on the knee. Just at that instant, I experienced a dream which seemed to me such a clear example of a dream peripherally directed, that as soon as possible thereafter, I wrote it out in full detail.

A few months after that, having occasion in my classes to refer to the peripheral direction of dreams, I related this circumstance, stating that a wooden box came downward from the left and above, and perched upon my knee. I said that the dream was so vivid that I could distinctly see the grain of the wood in the box. As soon as convenient afterward, I examined my notes on that particular case, and found that instead of its being a wooden box, my notes said that it was the sugar bowl on our dinner table that came down from above and from the left and perched upon my knee. My notes said that it was so clear and distinct that I distinctly perceived the figures in the decoration on the china sugar bowl.

Here was a dream that had been vivid. It had been reinstated clearly, and so definitely that it had been written out and its significance and importance as an illustration had been recognized. Notwithstanding all this, in a comparatively short time, it was related in all sincerity, with startling inaccuracy.

If we realize that dreams occur when there is a very small amount of nervous energy being liberated, we shall be able to understand several characteristics that would otherwise seem unexplainable, as well as avoid being deceived by inconsistencies in the report. It is this fact that explains why dreams are less vivid than waking experiences, and why they are so easily forgotten.

It is this fact, more perhaps than any other, that makes it impossible to credit the accounts of dreams which are related as evidence of a supernatural connection between dreams and subsequent events. Frequently we are asked to accept as evidence of a dream's coming true the testimony of some person whose mother told her that a friend had such a dream thirty years ago. No real confidence can be placed in the report of

such a dream unless the person has written it out as soon as he has awakened after the dream occurred.

The fact that a dream experience is so easily forgotten accounts for another characteristic. Many persons affirm that they seldom, or never dream. Miss Tina H. says that she rarely dreams. She experiences a dream no more than once a year. Miss Mildred M. states that she has experienced only one dream in the past seven weeks. Miss Gladys M. states that she dreams not more than once a year. In these reports, shall we accept it as a fact that dreams do not occur, or shall we rather believe that dreams occur but are forgotten? Do the weak nervous impulses traverse the brain centers, or is there a total cessation of brain activity? Some indications would seem to imply that the dream activities are in progress, but that they are forgotten.

Thus Miss Florence G. states that she never dreams. So far as she knows, she has never experienced a dream, such as other persons describe to her, but her family report that she talks in her sleep. Similarly, Miss Lillian S. states that her father has told her that on several occasions he has found her in the library at night, with the lights going, reading a book, but thoroughly asleep. On such occasions he does not wake her up, and she remembers nothing of the circumstances in the morning.

Probably nearly all of our dreams are thus forgotten. Only those that are accompanied by the strongest of the nervous impulses when we are asleep, such as those which occur just as we are at the point of waking up, are remembered. Those which occur as we are just passing into the conscious condition, at the point of waking, are not only accompanied by the strongest impulses that occur in sleep, but they are at the same time the most recent, and consequently have had the least time in which to be forgotten.

The second characteristic of dreams, in which they differ specifically from waking mental experiences, is that they are fantastic in character. The dream is fantastic, the parts often disjointed, and in consequence of this disjointed character, apparently illogical. Much of the inaccuracy in reporting dreams comes from the attempt of the person so reporting to make a connected sequence of the incidents of the dream, when it is

impossible for him to do so. The dream consists of a series of elements between which there is little logical coconnection apparent.

The explanation of this fact has been the stumbling block in all interpretations of dreams. It seems difficult to propose any hypothesis that will account for the apparently contradictory phenomena that dreams manifest. It appears, however, that we may account for all the phenomena by a reference to the nervous processes that accompany dreams. In a dream, the nervous impulses are not directed by attention, but follow the paths of least resistance at any particular moment. What these least resistant paths may be at any time is determined by such a large number of infinitesimal determining factors, that it is impossible to predict the course of the impulse.

When we are awake, we may by a process of attention direct the path of the nervous impulse. We can think of one thing and refuse to think of another. The mechanism by which this result is accomplished is a matter of conjecture and hypothesis, but the fact is clearly evident. In our waking thoughts, we are not dependent upon the fortuitous circumstances of the brain conditions at any particular moment. In our dreams, destitute of the attentive processes, we are.

These fortuitous circumstances may be of two kinds. One is peripheral and the other is central. The direction that our dreams take is sometimes determined in part by an outside stimulus. The example cited above to illustrate the difficulty of making an accurate report of a dream, is a good example. Another is the following: Miss Florence R. dreamed for two nights in succession that the house in which she was sleeping was burning. On both occasions she waked up, and found that the moon was shining in her eyes. The next night, she closed the window shade and no repetition of the dream occurred.

But the principal factor upon which the fantastic character of our dreams depend is the series of central circumstances. The nervous impulse follows the path of least resistance at any moment, undirected by attention. It is this fact that enables us to understand the most contradictory phenomena of dreams.

With these two differences, which are comparatively unimportant, the mental work in sleep is identical with that of the waking hours. When we recognize that the mental pro-

cesses in sleep are essentially identical in their nature, with those of our waking hours, we shall not be surprised that much mental work of a highly important character is done in sleep.

Miss Lillian S. reports that on one occasion, when her mother was away from home, she found on her table in the morning, a letter to her mother, in her own handwriting. It was a good letter, stating very clearly just the things that would most interest her mother, and which her mother would most wish to know. It seemed evident that she had arisen in the night, and had written the letter without waking up. The letter was so satisfactory that she enclosed it in an envelop, and mailed it without making any change in it.

Miss Catherine C. states that when she was a student in the high school, she was much troubled over a problem in algebra. She went to sleep thinking of it, and dreamed exactly the steps that must be taken in the solution. As soon as she awakened, she placed the solution of her dream on paper, and it was correct in every particular.

In this account we must suppose that in the waking hours, when attention was active, she was trying to force the nervous impulses over paths that were difficult of access, and which were not those which stood in the closest relation to those through which the impulses were already passing. But in sleep, the nervous impulses found the pathways most easily accessible, and the corresponding mental processes represented an easy solution.

The process is quite similar to that by which we try to recall a name, or think up an appropriate word. The more intense the attention which we give to the attempt to recall the name, the less likely the name is to appear. But when we cease to attend to the process, and leave our mind blank, as nearly as possible, attention held in abeyance, the name or the word is more likely to appear.

The same explanation will very satisfactorily account for the instances in which a lost article has been found, or its location disclosed, in a dream. Mrs. Bessie J. says that one time when she was a little girl, she had a fifty cent piece which was a great treasure to her. She lost it and no amount of searching would enable her to find it. In the course of several days, she dreamed that her coin was in a hat box where she kept a

new hat that she treasured highly. When she awoke, she went to the hat box and there found her coin.

As in similar examples, we may easily understand the dream result by supposing that the nervous impulse, undirected by attention, found its way into the channels most easy of access, and traversed nervous arcs that had been traversed on the occasion when the coin had been placed in the hat box, but which by conscious attention, it was prevented from entering in the waking period.

A somewhat similar example is reported by Mr. Arthur H. who relates a dream that occurred to his brother, who is a book keeper. He had failed for two weeks to obtain a proper trial balance. He was very much concerned over the matter. In fact, it worried him greatly, and worry means intense and continued negative attention. One night, he dreamed of a voice saying to him, "Eighty cents in Sid Fuller's account." He awoke, finding himself standing on the floor, looking at the wall. He immediately examined Sid Fuller's account, and there discovered the error.

This account seems to verge on the mysterious, but if we realize that in sleep the impulse is not directed by attention, but follows the path of least resistance, we shall see why in so many cases an accurate judgment is rendered from the data at hand, which in our waking hours, when we are directing the impulse by our attentive processes, it fails to enter upon the proper combination for a correct judgment. There is nothing mysterious about such cases, except the mystery that is involved in the making of any judgment.

This fact that attention is lacking in dreams will explain for us all the examples in which long forgotten experiences are reproduced or remembered. Many experiences are reproduced in sleep without their being recognized as having been previously known. There is without any doubt, some truth in Freud's assertion that early experiences which are not remembered, give direction to many dreams.

Possibly the following two cases may be examples of this principle. Miss Louise H. reports that she rarely dreams. She has experienced only one dream in her life (that she remembers) but that dream has occurred to her three times; the second time after an interval of several months from the first,

and the third after a still longer interval of several years. She is sure that there is nothing prophetic in the dream, and has no knowledge of any circumstance that might have determined its direction. The dream is one in which she finds herself standing at the top of a high tower, near the foot of which an army is passing, and she is throwing things down upon them.

Perhaps the second example is to be explained in the same way. Miss Ina F. rarely dreams. She has had an experience with only one dream (that she remembers) but that dream has been repeated four times at long intervals. The dream is one in which she finds herself seated at the top of a high hill at the base of which a river is flowing. A big hog comes along and roots her off into the river. She struggles in the water, and sinks twice, but before she sinks the third time she wakes up.

It is very possible that some long antecedent experience occurring too early for her to remember it, has furnished the basis for this dream.

Nearly all dreams are either visual or auditory, but other sensations may enter into a dream. Miss Hattie C. reports a tactual dream that has been repeated three times in about five years. The dream is one in which she feels the touch of her father's hand upon her head. Smell sensations sometimes occur in dreams, and the present writer has on more than one occasion experienced a taste dream. One such dream involved a scene in a barber shop. I went to take a drink of water from the receptacle provided, and the water tasted stale, flat and unprofitable. It tasted about as water tastes after it has stood all night in a cedar bucket. Perhaps a long antecedent experience with such a situation induced this particular form of the dream. The barber called attention to a vessel of fresh drinking water, but other incidents crowded in, and I did not get a taste of the fresh drinking water.

It is safe to say that any sensation that is, or has been, experienced in the waking hours, may enter into a dream.

One form of intellectual work in dreams is so unexpected and so curious that examples of it invariably provoke interest. Sometimes a person has a dream of poetry, and Coleridge is said to have dreamed the entire poem of *Kubla Khan*, and after awaking, he wrote it out just as he had dreamed it. He said

that there were thirty or forty lines more of the poem which he was never able to reproduce.

Miss Muriel P. has described to me an experience of dream poetry, on the very day of its occurrence. Following is the account of it in her own language just as she wrote it out: "On the evening of July 26, 1914, I was trying to study a hard lesson in bacteriology, and was greatly annoyed by the yowling of a cat on the side lawn. It seemed impossible for me to concentrate my thoughts on that lesson. Finally, I went to bed and for a long time continued to hear that cat. When I awoke the following morning, the appended verses were running through my mind. I wrote them out immediately, and the words and sentences seemed fairly to tumble out. The sixth word in the second stanza was the only word about which there was any hesitation.

An accomplished cat with extremely good lungs
In the side yard paused last night.
There were squalls and growls, and snarls and howls,
He started a beautiful fight.

That accomplished cat was a (pagan) (heathen) at heart,
For till far in the early hours,
His war dance went on with accompanying song
As he dodged the local showers.

My ink bottle went, can't imagine how,
To join the motley array
Of various things, all given that cat.
They were found on the lawn next day.

For hours I dozed and cursed that cat
In a voice persuasively clear,
While the murderous thoughts I thought that night
Make me shudder even here.

I was not there when he left this sphere;
Aid,—a brick from the watchman. Oh,
But I fully expect to meet that cat
When to future worlds I go.

His basilisk eyes will welcome me
To the warm climate of his land
The devil himself will appoint me to lead,
And have the wail of that cat in his band.

In somewhat a similar manner, Miss Hester P. relates that on one occasion, very recently, she had been assigned the task of writing a parody on the Lost Chord for a lesson in English. She had discovered that it was very difficult for her, and had delayed writing it, or had failed to accomplish the task until the time for the exercise to be turned in was close at hand. She went to sleep thinking about it, and dreamed a whole poem, which she wrote out immediately upon waking up. The poem consisted of six stanzas, and the character of it may be judged from the first stanza:

Seated one day in the schoolroom,
I was weary and ill at ease
And my pencil was tapping nervously
As it struck my shaking knees.

Similarly Miss Margaret McG. reports having dreamed a poem of four stanzas, which she wrote out immediately upon awaking. The quality of it may be judged from the first stanza:

As I was walking down the street
A little man I met
Whose face was just the kind of face
That I would like to pet.

The absurdities of such poetry do not impress of dreamer. There is no feeling of the absurd, ludicrous, nor ridiculous when such a dream is being experienced. The dreamer has no feeling of surprise nor emotion of any such nature, in the dream. Such poetry appears to the dreamer to be of the highest degree of excellence.

The present writer has had a somewhat similar experience, and can testify definitely to the circumstances. On four separate occasions, I have had a dream of poetry, three of them limericks, which is about the limit of my poetical ability, but in the morning, I have been unable to remember or reproduce a single line of it. It appeared to me when I was dreaming it, to be remarkably good poetry. It seemed to me in my dream,

that the fourth poem was decidedly better than anything that Browning or Shelley ever wrote. But on a subsequent occasion, I had a dream of poetry, and immediately upon waking wrote it out without the least hesitation. It was a reproduction of what was dreamed, not a composition at the time of writing. The excellence of the poetry of the previous dreams may be judged by the fact that in the dream, this poetry appeared to be a masterpiece. It appeared to be quite the equal of Tennyson's Crannied Wall, or Browning's God's in His Heaven.

When the winter is sped,
And the trees are dead,
A voice comes cold and gray;
Go scan your van
And trap your man
And don't let him get away.

There was a slight uncertainty about the fourth line which disappeared as soon as I recognized the occasion for it. In my waking experience I was trying to make the thing have some sense to it, to make it represent some logical connection, while in the dream there was none, and the lack of logical reason in the dream did not make itself felt.

In dreaming, the lack of anything approximating logical connection is not felt, and occasions no discomfort nor surprise. This same fact will also account for the exaggerated estimate of the excellence of the poetical effusions composed in a dream. It might be described by saying that the critical sense is altogether lacking in a dream, but this is not only a crude, but an inaccurate method of describing the condition.

It is this lack of logical connection in our dream and our attempts to make the connection logical in our waking reports that is the occasion for so much inaccuracy in accounts of dreams. A dream is generally a series of incidents, slightly related to each other, with only a slender thread of connection, very easily forgotten. We try to make the dream connected, and thereby introduce into the account, elements that really did not appear.

It is a curious fact that this lack of logical connection, which awakens no surprise in the dreamer, is taken by many persons to indicate a supernatural origin for dreams, and to

show that the dreams are engendered by higher processes of reason than the person is able to manifest in his ordinary waking hours. The real explanation is one that is far removed from this.

As a result of the small amount of nervous energy in sleep, there is a small amount of feeling experienced. The lack of surprise, or other feeling attending the perception of the dream absurdities, which we have already noticed, is equally manifest in all dream experiences. Even in those dreams which we believe to be attended by a great deal of feeling, we shall be compelled to recognize that the feeling is a good deal less than it would be in our waking condition, if we were to be placed in the same situation in which we find ourselves in our dream experience. We think that if we can go to sleep, our pains and worries will disappear. As a matter of fact, our pains and worries must disappear before we go to sleep, or they disappear as we go to sleep. The decrease of the amount of nervous energy liberated is an essential condition, both of the sleep and of the decrease of feeling.

Notwithstanding the very common belief in the prophetic character of dreams, an examination of every so-called veridical dream, in which a prophetic anticipation has been followed by its verification, will be found lacking in accuracy of report, omission of some important circumstance, lack of connection between the dream and the event that is described as its verification, or accounted for by mere coincidence. In a few cases, the approach of oncoming disease has been foreshadowed in a dream before it was apparent in the waking experience. This arises from the lack of direction of the nervous impulse by attention, the impulse taking the path of least resistance, which in our waking hours it might not do. As a result of this course of the impulse, diseased organs or diseased centers may have been detected.

Let us then repeat, that the mental processes in sleep are of exactly the same kind as are the mental processes when awake. The differences that are noticed arise from two characteristics, first, they are less vivid, in consequence of the diminished amount of nervous energy in sleep, and second, the nervous impulses are not directed by attention. Practically every difference between a dream and a waking experience

will find its explanation in one or the other of these two characteristics. There is no occasion for the introduction into the discussion of dreams, of such conceptions as an unconscious mind, a subliminal self, an objective or a subjective mind, a psychic censor, nor any other of the mystical creations that are so highly favored by many persons.

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CHAPTER XIII

TURNUED AROUND; OR ILLUSIONS OF ORIENTATION

It is a very uncomfortable situation when a person's consciousness and compass do not agree. When he has a feeling that a certain direction is east, and the compass says it is north, the disagreement is anything but pleasant. It is a phenomenon that is difficult to explain, but it is no uncommon experience with many persons. The accounts of the experiences that have been collected from several persons are very instructive.

The experience of Miss Grace E. is one of the most common type. When Miss E. is in Battle Creek, she knows that the direction which seems to her to be north is really east, and that the sun will rise in that place. The same condition exists in Kalamazoo. It is always and invariably a shifting of the cardinal points ninety degrees to the left.

In much the larger number of cases, the shifting of directions amounts to exactly ninety degrees, although in some instances the shifting is through 180 degrees. It is almost invariably one or the other of these two amounts. Possibly this may be accounted for by the fact that according to our system of noting directions, there are only four cardinal points. If we habitually employed a system of six cardinal points, we might find that the shifting would be generally, through 60, 120 or 180 degrees.

Different places may show different degrees of shifting for the same person. A person may be turned around 90 degrees in one place, and 180 degrees in another; but it is rarely that the shifting is for any different number of degrees than 90 or 180.

In nearly all cases the amount and direction of the shifting is constant for any one locality. It is rare to meet with a variation in the shifting for any person in the same place. However, the case of Miss Alice F. is one which shows this variable shifting. Miss F. lives several miles from the nearest town, and has occasion to go from her home farm to town several times a week. She always goes over the same road. Sometimes it seems to her that she is going west when she goes to town, and at other times it appears that she is going south.

There is no uniformity in the experience. The direction that she really is going when she is on her road to town is east.

Generally, the directions are learned primarily for one place, and this system of direction is transferred subsequently to other places. If the systems of the two places agree, there is experienced the feeling of harmony, or of being straight. But if the system of directions in the second place fails to agree in consciousness, then there is a feeling of strangeness. It is the lack of agreement which seems to give rise to the uncomfortable feeling. It is this fact which constitutes the exceptional character of the experience of Miss Geneva S.

Miss S. has an experience with direction that is very annoying to her. She is permanently turned around. At home, or in any other place to which she may go, north is always south, and east seems always west. She has never been in any place in which this annoying contradiction did not occur. She attributes it to the fact that as a child, she learned the directions in school, from a map that was hung on the south side of the room. She expresses her opinion that a teacher who teaches children from a map hung on the south side of a room, ought to be hung up on the north side herself.

The present writer has had many experiences with being turned around, and has studied his own experiences with a great deal of care. Two examples, noted carefully at the time they occurred, are very instructive. As a preliminary, it may be stated that the writer lived for four years in one place where east always seemed north. Coming back to that place after a return to his early surroundings, the directions would be all straight until he stepped off the train, when suddenly it seemed that the entire universe would swing through an angle of 90 degrees. In another place, he lived six years where exactly the same condition prevailed. So long did this system of directions persist in this period, that, while the strangeness was never overcome, the directions in the locality of his early home, where the directions had been originally learned, began to feel equally strange. In another place, he lived more than a year, where as in the other two, the sun rose directly in the north every morning.

The first of the incidents referred to above, may be described as follows: I was going from Chicago to Mattoon over

the line of the Illinois Central railroad, the general direction of which is straight south. As the train approached Champaign, one of the towns where, according to my experience the sun rises in the north, I began to wonder if the directions would change, or would it be different from what it was when I was a resident of that place. With note book and watch in hand I waited for anything that might happen. As the train drew into the station and came to a halt, there was a period of ten seconds, or such a matter, when it seemed as if the situation hung in the balance. It was uncertain which direction would prevail. Finally, the former direction prevailed, and the universe swung 90 degrees around, and the train was headed east. Careful note was then made to see if the reverse change would be made when we had passed the town. The train appeared to be going east for a distance of about two miles, when suddenly, without any hesitation, the directions changed again and we were going south. A mental map was then drawn in the notebook to show the direction of the train. It could be pictured as making two turns, one to the east, and another about two miles farther along to the south.

Another experience will perhaps assist to an understanding of the psychological conditions that enable one to determine directions. One time the writer spent one week in New York, where for him, the same system of directions prevails that exists at Champaign. The sun rises in the north. Leaving New York in the early morning, Buffalo was reached over the Lackawanna line late in the afternoon. Buffalo was somewhat familiar from previous visits, and the directions in that town are straight. Consciousness and the compass agree. But the Lackawanna depot was an unfamiliar locality, never having traveled to Buffalo over that route before. Starting north, or what seemed to be north, to reach the main streets of the town, the writer found himself getting into a part of the city that looked as if it was not likely to lead to the intersection of Main and Seneca Streets. Then arose the question Why? Which way did it lead, and why did this direction that seemed to be north, not take us up toward the streets from which the desired intersection could be reached. Could it be that the New York system of directions was still prevailing? If so, I was going east instead of north. A trip back to the Lackawanna depot, and a

new start in the direction that seemed to be west, but which must be north, if the New York directions still prevailed, soon demonstrated the truth of the hypothesis. In a short distance, the directions changed, and the direction that had seemed to be west, now appeared to be north.

This experience will enable us to suggest a hypothesis to explain the turning around. To some persons, and the writer is one, a system of directions constitutes an invariable background for any experience in space. The perception of directions, with the transmission of an impulse through the brain centers that correspond to the perception of the directions, is an invariable accompaniment for any such experience. But in a new place, where the actual directions, as would be indicated by a compass, are unknown, a new background of directions is built up, and if there is a misjudgment of the directions on which the background is built, we subsequently find ourselves turned around. When such a background is built up on a wrong foundation, it is very difficult subsequently to replace it by one built on a correct foundation. The false directions are likely to persist.

The example of Miss Elizabeth M, is a very clear case of the persistence of the false directions after years of repeated experience in shifting from one set of directions to the other. Miss M. lives several miles out of Jackson, and she attended school in that city. Whenever she goes from her home to Jackson, the directions are perfectly correct until she arrives at a certain corner in the town, when they appear to change. No amount of reasoning, or observation can produce any other effect.

The persistence of the false system of directions is pronounced in nearly every case. However, after a prolonged absence from one locality, especially if the original stay has been brief, it is possible that a different system of directions may be substituted for the false system that was first acquired. With the present writer, such a change has occurred in a few places, noticeably so in Philadelphia. On a first visit to that city, the directions were wrong, and the sun rose in the north. After an interval of two years, the directions were recognized on a second visit as correct. But in places where the stay was prolonged, as at Champaign, the background built up on the basis

of the correct directions, is never likely to be substituted for the illusory one.

Whether the directions appear correct or not, will depend upon the background of directions upon which the locality is perceived. This background evidently has for its concomitant, some particular combination of cells, in the brain which is slightly different for each series of directions. So a substitution of one background for another is accompanied by a slight shifting of the nervous impulse from one combination of cells into another only slightly different.

An inquiry of one class of 63 students disclosed the fact that more than two-thirds of them did not have any background of direction for their perceptions, and did not feel the need of any. Forty-four of them asserted that it made no difference to them whether they knew which way was north or not. Such persons can never experience the feeling of being turned around, which makes some of us so uncomfortable.

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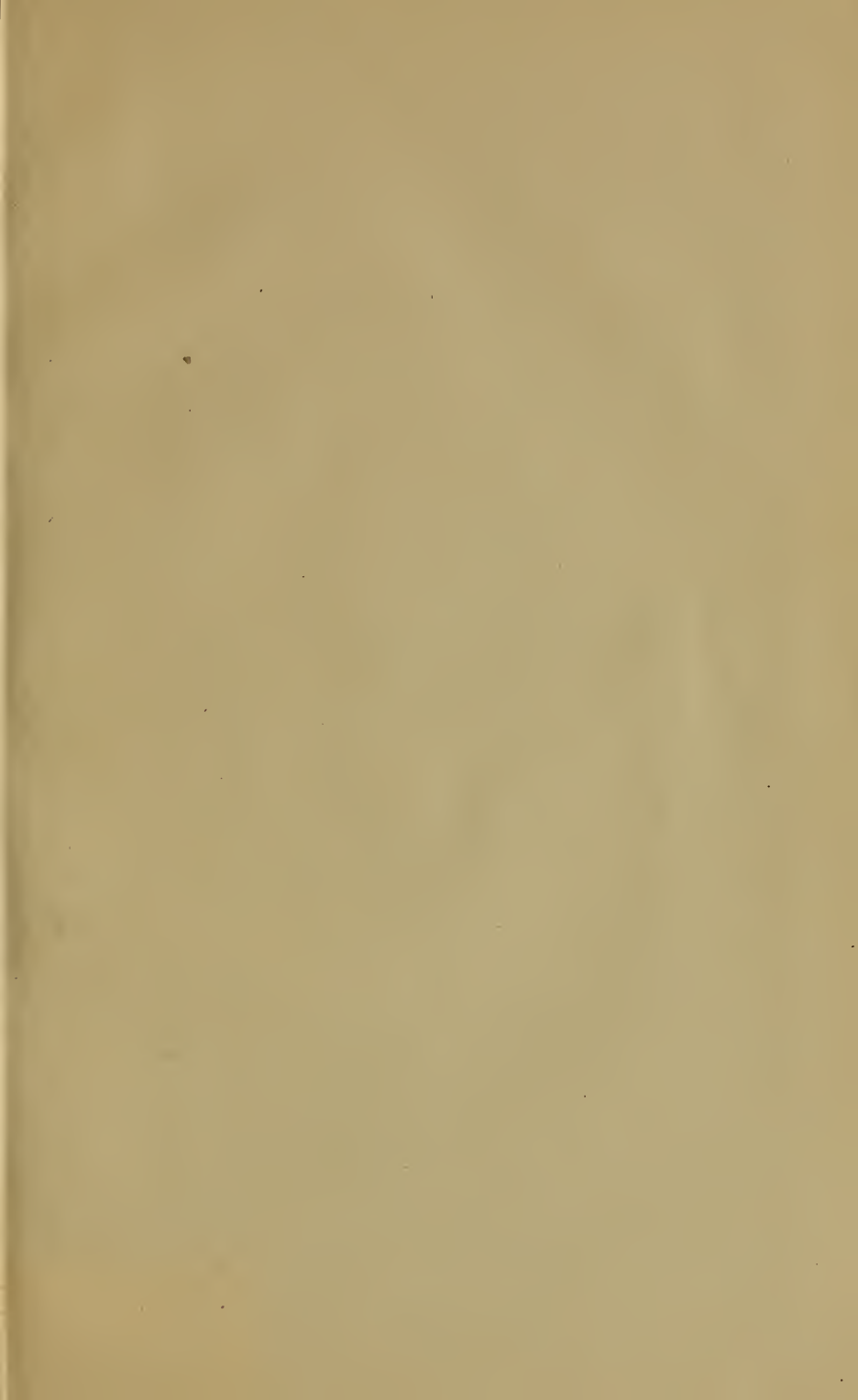
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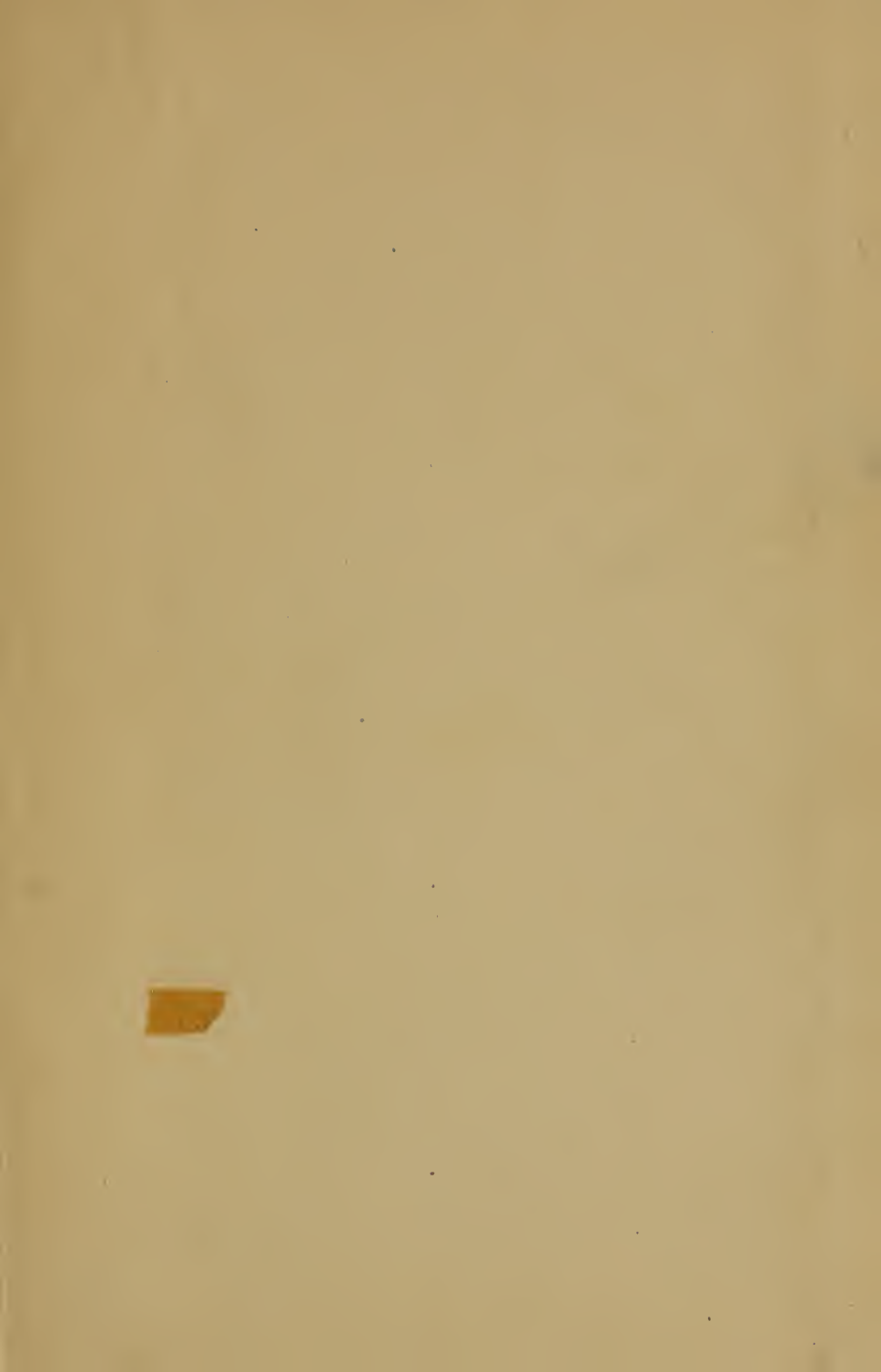


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